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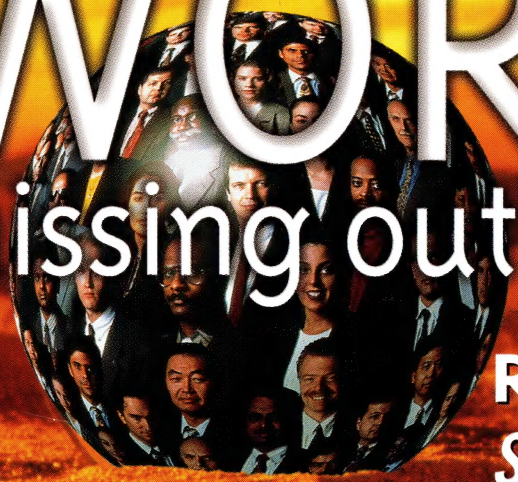

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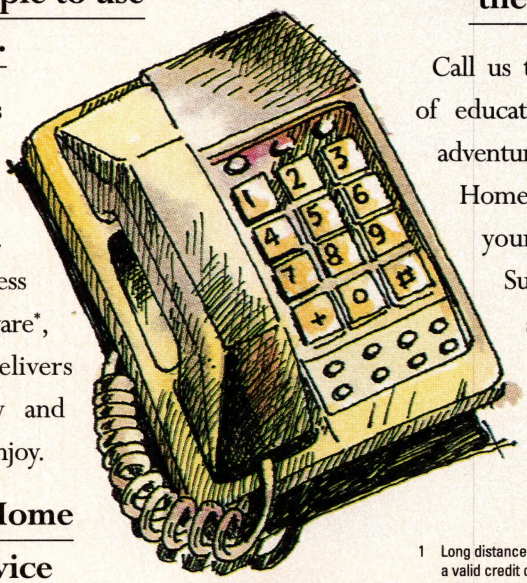

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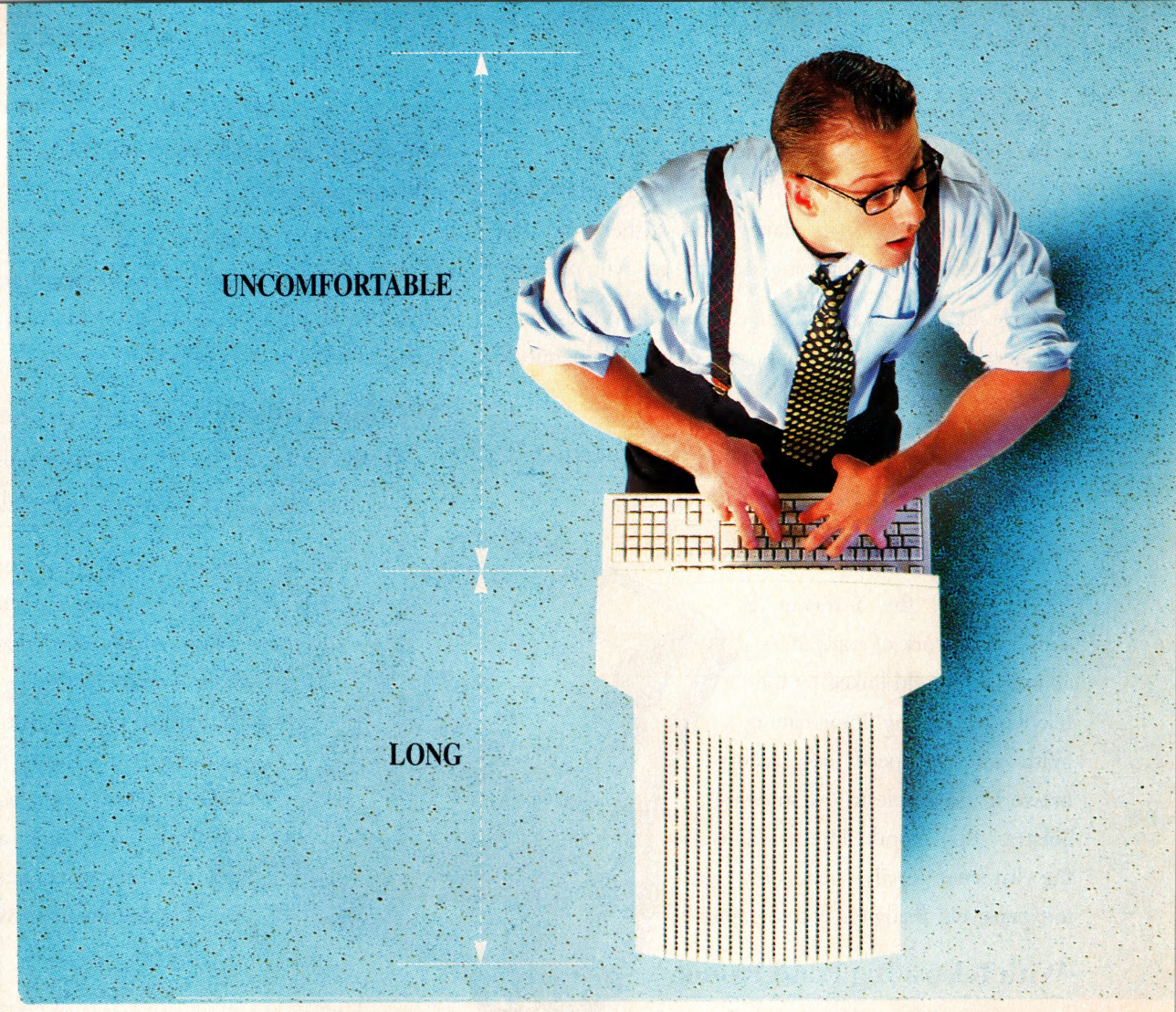
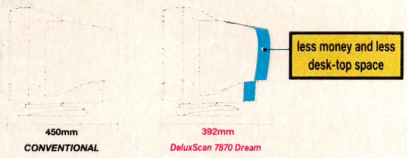


Introducing the DeluxScan 7870 Dream, the newest member of the Hyundai DeluxScan monitor family. Featuring an innovative short-length CRT which gives it virtually the same profile as a 14-inch monitor, the space-efficient 7870 Dream is a leap forward in monitor ergonomics and convenience from Hyundai, an emerging international electronics leader.



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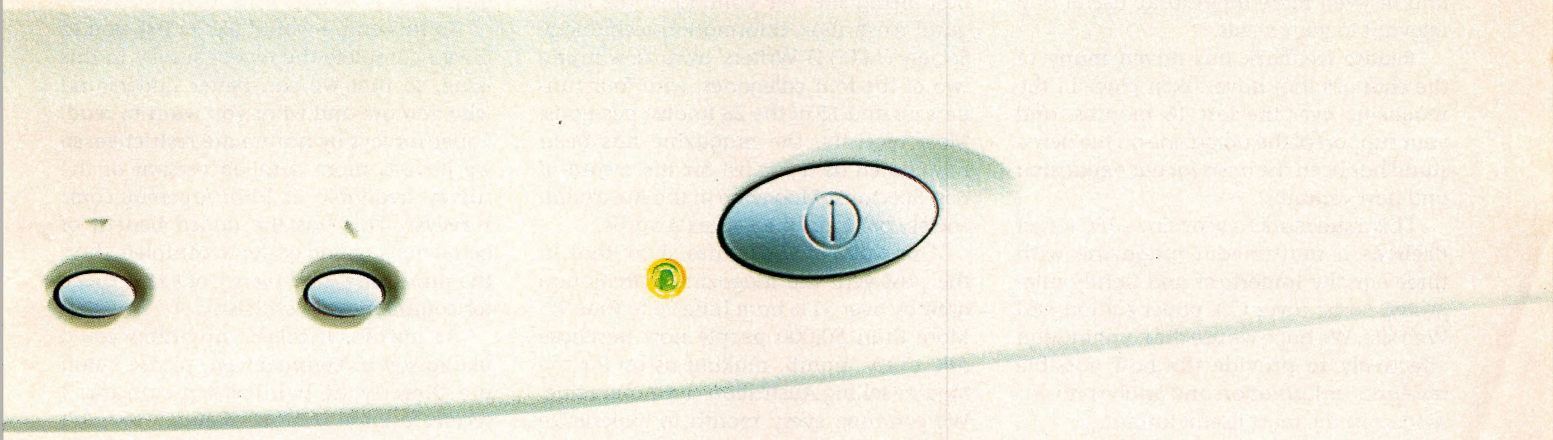

USB Connectivity
DeluxScan monitors are among the first to offer USB(Universal Serial Bus) connectivity through a hub* built into their swivel base. Simple and flexible, USB will allow users to hot-plug up to 127 devices like keyboards and mice without worrying about drivers and installation difficulties.

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DeluxScan monitors are certified Windows 95 Plug-and-Play ** compatible by Microsoft. That means users will enjoy maximum performance from the moment they plug their DeluxScan monitors in.

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DeluxScan monitors surpass these power management guidelines and standards to minimize energy comsumption, ultimately conserving our natural resources.

MPR II & TCO 95 Certified
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VESA Standard 85 Hz Refresh Rate
DeluxScan monitors support refresh rates up to 85 Hz+, the latest VESA standard, for a flicker-free picture users' eyes will appreciate all day long.

3-Year Warranty
Hyundai stands behind its products. That's why DeluxScan monitors are covered by a 3-year-limited++ warranty through an expanding worldwide service network.

*USB hub is being added to all DeluxScan models. **Plug and Play requires DDC 1/2B compatible graphic card or USB compatible devices. +Actual scan rate depends on graphic card and selected resolution. ++CRT, parts, and labor only. See product literature for complete details. All trademarks are property of their respective owners.

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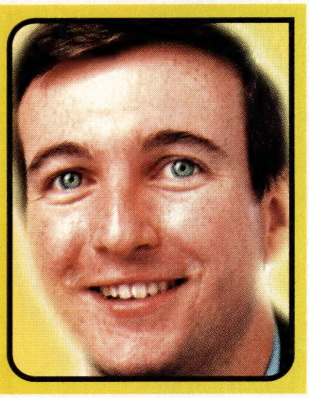
Editorial



Where do we go from here?

As a magazine, we owe you a great deal of thanks for your support. And we'd like to know how we can improve to be even more useful to you.

By Jeremy White

For the most part, this Editor's page is reserved for discussions about computing and its impact on our lives and work. Every now and then, however, there are changes or developments at *APC* itself which we feel are worth covering.

This month I have even greater reason to make this page less analytical and more personal. I'd like to say thank you for your support and feedback, and to exhort you to tell us what we need to do to improve and be even more interesting, useful and relevant to your needs.

Reader feedback has driven many of the changes that have taken place in the magazine over the last 18 months, and your support of the magazine on the newsstand has been the basis for our expansion and new ventures.

This issue marks a year since *APC* recast itself as a multimedia magazine with three equally important and tightly integrated parts: cover CD, paper edition and Web site. We hope we use the combination effectively to provide the best possible resources, information and analysis to our readers in the most useful format.

We aim to be a very reader-driven magazine, not only by advising our readers on technology and looking out for their interests, but by producing a magazine which responds to the changes occurring in technology, communications and media and guiding our readers through them.

APC has been through a great many changes as a result. Our readers expect us to not only cover the cutting edge, but to be at the cutting edge.

Since our relaunch last September we've tried to follow a strategy of continuous improvement, instigating major changes for our Web site and cover CD, and most recently a redesign and restructuring of the paper edition of the magazine.

We're very proud of the fact that the magazine is now 100% Australian, and that we have the largest and most experienced team of technology journalists and production staff in Australia.

In addition, the magazine and its writers have received or been finalists for a plethora of awards. Even before its relaunch, our Web site was a finalist for the last Telstra/AFR Internet Awards as best media site. We dominated the inaugural Australian Information technology Society (AITS) IT Writers' awards, winning two of the four categories, with four runners up and 15 of the 25 finalist positions. Most recently, the magazine has been nominated as a finalist for the award of Best Specialist Magazine in the Australian Society of Magazine Editors Awards.

Our latest audit figures show that in the past year the magazine's circulation grew by over 31% from June 96 to June 97. More than 50,000 people now purchase *APC* every month, making us by far the biggest-selling Australian computing title. We continue every month to experience record copy sales, and that growth rate looks likely to continue.

However, as gratifying for us as an editorial team these results might be, we are keenly aware that our readers are fundamentally the determinant of our success. We know we will only receive your support and be able to grow so long as we do a good job of catering to your needs.

This is truer than ever before in a world of instant access Internet time, breaking down the barriers between consumers and their interests. If you can go direct to IT companies to read about their strategies and products, or read US or other overseas media easily on the Web, then we need to provide a compelling reason for you to buy and read *APC* each month.

We believe the key to providing compelling content is to have the highest quality analysis and testing, to be authoritative, credible and worthy of your trust, and to provide a genuinely Australian perspective on the global phenomenon of technology.

Above all we need to be relevant to you and responsive to your needs and interests.

To this end, I would like to ask you to please complete the reader survey in this issue, so that we can better understand who you are and what you want to read. Paper surveys by nature are restrictive, so we have a more detailed version of the survey available at http://apcmag.com/surveys/. This has the added benefit of being quicker and easier to complete than the paper one, and plenty of extra space for comments and criticisms.

As always, if there's anything you'd like to say or comment on, please email me directly at jwhite@acp.com.au. I receive a large volume of email, so can't always reply quickly, but I do try to reply to all my emails.

Thank you again for your phenomenal support of the *APC* team, and I hope we can use your feedback to make the magazine even better.■

Reader survey

Please help us to make *APC* a better magazine. Complete the reader survey on page 145, or on the Web at http://apcmag.com/surveys/. You'll also have the chance to win some great prizes by participating.

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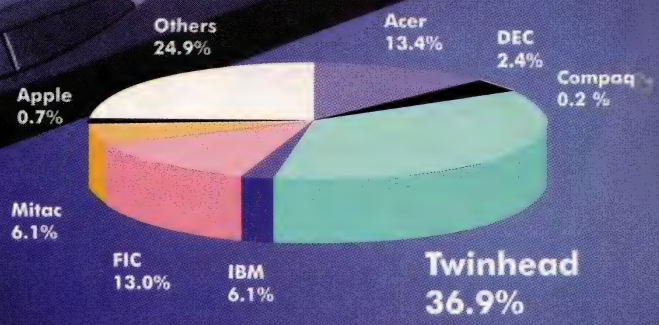

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First Take and Reader Request

Microsoft Internet Information Server 4.0 Beta 2 ■ NetRexx 1.02 ■ QNX Demo ■ SmartTax Lite

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Fallen Haven ■ Triple Play 98: Home Run Derby ■ Motor Racer GP ■ Donkey Kong ■ Super Mario Bros.

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Microsoft IIS 4.0 Beta 4 ■ Lotus Notes 4.6 Pre-release 2 ■ Netscape Enterprise Server 3.0

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WS Archie ■ fpArchie 0.9 Beta 1 ■ Anarchie 2.01 ■ WS Finger ■ Finger 1.5 ■ Gibbon Finger ■ Thumb 1 ■ CuteFTP 1.8 ■ WS_FTP Pro 4.5 ■ NCFTP ■ WSGopher ■ LA Gopher 1.1 ■ Turbo Gopher VR 2.1a4 ■ mIRC 5.02 ■ PIRCH ■ ICQ 1.10 Beta ■ GT IRC 2.0 ■ IRC/2 0.78 ■ IRCLE 3.0 ■ Eudora Pro 3.01 ■ Pegasus Mail 2.53 ■ Microsoft Mail and News ■ PMMail 1.91 ■ Forte Free Agent 1.11 ■ and more

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Microsoft Internet Explorer Platform Preview Suite 4.0 ■ Microsoft Internet Explorer 3.02 ■ Microsoft Internet Explorer 3.01 ■ Netscape Communicator Pro 4.01a ■ Netscape Communicator 4.01a ■ Netscape Navigator 3.02 ■ Netscape Navigator 2.02 International Version

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Coming up

In our October issue we will:
- Talk to Brian Johns
- Compare digitising tablets
- Look at the commercialism of the Net versus its community spirit
- Drink in some Java applications
- And compare Communicator with IE4

As well as all the regular sections, forums and commentators

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Legend

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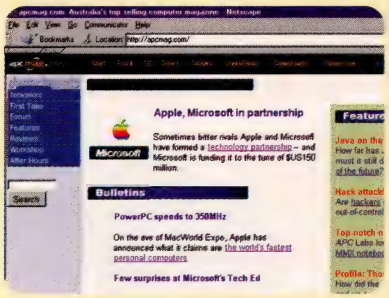

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Editor Jeremy White – Australian Personal Computer
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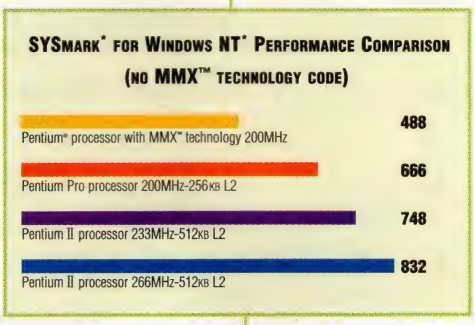

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Newswire

CHANGE OF HEART

Howard's big IT shift

The flu was not the only bug Prime Minister John Howard caught on his recent overseas trip. Howard has been bitten by the information technology bug, a conversion that has caused many within the industry to breathe a sigh of relief.

The first signs of the transformation came when the born-again technologist spoke on radio in far north Queensland in July. He began to sell the concept of using IT to deliver massive benefits to the Australian economy.

"Information technology is the area of fastest job growth in the services industries in Australia," Howard said.

He said the most powerful message he got from his US trip was that the country's economic boom was related to the massive IT investments it made a few years ago.

Howard is expected to make a major speech outlining government IT strategies in the near future (it may have happened since this was writ-

Continued on page 20

WILL FREE SOFTWARE SUFFER?

I2O raises industry suspicion

A proposed standard for improving performance on servers has raised concerns over its inability to be used by developers of non-commercial software.

I2O, which is being developed by a group whose members include Microsoft, Intel, Compaq and others (see box), is a broad specification for a standard interface for high-performance input/output systems. The I2O special interest group (SIG) was founded in January 1996, and Version 1.5 of the specification was adopted in March this year.

I2O achieves better performance by improving the intelligence with which input/output requests are handled at the hardware level, and by minimising the level of core resources used to handle such requests. I2O's overall architecture is intended to be platform-independent, and device drivers working within the I2O architecture should contain elements which are portable across multiple platforms.

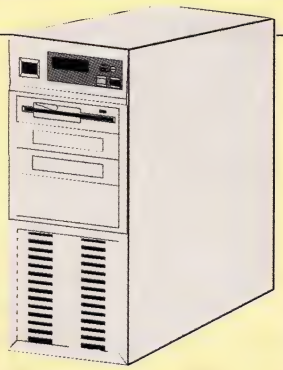
The main concern for many users is not how I2O works, however, but the way in which it is being implemented as a standard. While the I2O SIG describes its work as the creation of an "open, standards-based approach", only companies which have paid a membership fee can develop software that works under the specification.

Membership fees are set at $US5,000 for voting membership and $US2,000 for associate membership, with additional fees for development documentation. Non-members can obtain a full copy of the I2O specification by paying a $US250 fee and signing a non-disclosure agreement.

The most likely victim of this "commercialised standard" would be the many flavours of Linux, the public-domain, freeware operating system based on Unix. Because Linux is developed under a non-profit model by many individuals, the licence fees required by the I2O SIG could not be paid. As well, the open nature with which Linux source code is shared would be contrary to the non-disclosure requirements of I2O SIG mem-

Continued on page 20

SILENT SUPPORTERS



Companies on the I2O steering committee include:

- 3Com
- Compaq
- Hewlett-Packard
- Intel
- Microsoft
- NetFRAME
- Novell
- Symbios Logic

Companies underlined have a permanent position on the steering committee.

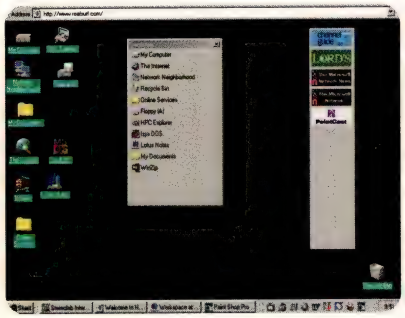
Other member companies include Bay Networks, Cabletron, Dell, Digital, Motorola, NEC, Seagate and Tandem. At press time, more than 110 vendors had joined the I2O SIG.

News roundup

Ouch! While losing $US56 million in just three months isn't something many companies would be proud of, it came as something of a relief to Apple, as analysts had predicted quarterly losses as high as $US100 million dollars. The loss followed hard on the heels of the resignation of CEO Gil Amelio and chief technology officer Ellen Hancock. The swift exit doesn't appear to have permanently tainted Hancock's vision of the company. She told *MacWeek* she would welcome the opportunity to serve as CEO of Apple, although that seems less than likely right now.

Microsoft kept its name in the press by buying a stake in Progressive Networks, the company which created the highly-popular RealAudio and RealVideo streaming services. A statement claimed that MS will work with Progressive to "define industry standards", which should be amusing.

Nothing happens quickly when you're Telstra. In Parliament recently, company reps started denying June reports that the company receives 75 cents from every dollar spent on the Internet in Australia. Telstra, IBM and Lend Lease also finally took their pens out and inked their long-awaited deal to create a new IT services business, Advantra. Telstra has taken up a 26% share in IBM Global Services Australia (formerly ISSC Australia), and handed over operation of its data centres to the new group.



RIVALS BURY THE HATCHET

Apple and Microsoft pair up

An historic rapprochement between long-time rivals Apple Computer and Microsoft may revitalise the troubled Macintosh maker — but it leaves a question mark on the future direction of desktop operating systems.

Under the deal Microsoft will invest $US150 million in non-voting stock in its troubled competitor, in addition to forging important new technical agreements between the two companies. Under those agreements, Microsoft has committed to deliver its flagship Microsoft Office application suite on the Mac platform for the next five years, and Apple will make Microsoft's Internet Explorer the default browser for Mac OS. Microsoft and Apple also resolved longstanding patent disputes by signing a broad cross-licence covering existing technologies and new developments over the next five years.

Initial industry interest has focused on how operating systems directions might change within the two companies. Microsoft's agreement on Office doesn't contain any firm commitment to develop for the forthcoming Rhapsody OS, and several industry analysts speculated following the announcement that Microsoft might try and urge Apple to adopt Windows NT or CE.

While Microsoft is planning to debut Windows 98 next year (pictured; see page 32 for our review), it is already playing down the new release in the business market, recommending it only for corporations whose machines don't have the hardware needed to run NT, or who require access to non-compatible 16-bit applications. By the year 2000, Microsoft anticipates that Windows NT will be the dominant operating system on desktop PCs in both the home and business market. The Windows CE handheld operating system will also be beefed up for use on set-top boxes and other information appliances, according to officials.

Apple officials, though, rejected suggestions that it might adopt a more NT-centric strategy. "We have not had any discussions about licensing Windows CE, and we don't have any plans at this time to license Windows NT," said Fred Anderson, Apple's chief financial officer.

Dan Tebbutt and Angus Kidman

Howard's big IT shift

Continued from page 19

ten, depending on his recovery). At that time, it is said, he will appoint a minister responsible for IT and online policy to help centralise strategy development. It is rumoured this will be Arts and Communications minister, Senator Richard Alston. A few months after the strategies are foreshadowed, and the relevant industries, associations and ministers have been consulted, it is believed Howard will put forward his IT industry blueprint for the future (for more discussion, see 'Children of the revolution', page 26).

From IT industry associations have come comments such as 'better late than never' and 'even though he's found out late, at least he has found out'. Underneath the cynicism, however, is optimism that Howard's conversion will be long-lasting, and that his stance will speed up the process of developing much-needed IT industry policy.

Selina Mitchell

I20 raises industry suspicion

Continued from page 19

bership. As a result, Linux might not be able to effectively support I20 peripherals.

While this isn't yet a serious problem, once support for I2O is implemented in commercial operating systems, the number of non-I2O compliant peripherals may dwindle. Current versions of both Windows NT and IntranetWare lack support for the standard. However, Microsoft and Novell plan to incorporate it in future releases, with Microsoft scheduled to include support in NT 5.0 and Novell due to release an upgrade module for IntranetWare later this year.

Some industry groups are already concerned about this aspect of the I2O project. "I suspect that if I2O peripherals become popular, free operating systems will be locked out from running on PC hardware," Bruce Perens, president of the non-profit Software in the Public Interest group (which promotes the development of Linux), wrote in a newsgroup posting earlier this year. "It's a closed standard, it requires a NDA, and you need a licence to develop software for it."

Hardware products using the I2O specification have been demonstrated by a number of companies, and are expected to enter commercial release beginning later this year. Intel's i960 RD processor already supports the standard.

Angus Kidman

News roundup

The ongoing battle between Symantec and McAfee is getting uglier. McAfee announced plans to sue Symantec for defamation after the latter issued a press release claiming that it had discovered additional instances of code stolen from Symantec products in McAfee products. McAfee has denied the allegations.

Fujitsu announced plans to spend $10 million on establishing a regional desktop support centre in Canberra — news which doubtless gladdened the hearts of all the local IT experts bracing themselves for job losses as outsourcing sweeps all before it.

On a related note, outsourcing organisation TM Direct has hitched a post to the Compaq bandwagon, becoming the high-selling PC vendor's first telephone-based national reseller. Local managing director Ian Penman told a group of sceptical journalists that this was not a response to the growing popularity of direct PC sales *à la* Dell and Gateway 2000, and that it would provide a substantial boost to the company's profits. It could use it; while Compaq's $US5 billion quarterly revenues are not to be sniffed at, local growth was just 13%, compared to a global 39% uptick.

The US Department of Justice (DOJ) will be keeping itself busy over the next few months. Not only have longstanding calls to investigate Microsoft reached fever pitch now that a few US politicians have worked out that

64 SOUNDS OF Car Racing

1 cars taking off 2 brakes screeching 3 hubcaps scraping 4 cheering 5 bets being placed 6 engine dying 7 hearts beating wildly 8 refuelling 9 wheels reversing 10 panting 11 "that was a close shave" 12 head-on collisions 13 bangs 14 engines revving 15 crowd roaring 16 explosion 17 driving into a pit stop 18 clanging 19 shrieks of horror 20 vroom 21 "low fuel!" 22 jamming on brakes 23 gears shifting 24 ambulance siren 25 sighs of relief 26 engines re-starting 27 sound of bare tyres 28 crowd going wild 29 "last lap" 30 bang 31 hubcaps falling off 32 tyres exploding 33 "fill er up quick" 34 engines sputtering 35 tyres being changed 36 nuts and bolts flying 37 grandstand cheering 38 gears cranking 39 heavy jamming on the brakes 40 sudden changes in direction 41 head-on crashes 42 tyres rolling off 43 skidding uncontrollably 44 screams 45 crowd falling silent 46 crash 47 thunderous booms 48 crowd roaring 49 quick turns 50 sudden stops 51 desperate braking 52 engines revving 53 sputtering 54 tyres screeching 55 shrieks 56 falling hubcabs 57 chants of the winner's name 58 refuelling 59 wheels being changed 60 sudden stops 61 accelerating past the finishline 62 champagne cork popping 63 congratulatory slaps on the back 64 whizzing pass.

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MODEM MANIA

NetComm, Banksia to join up

Even the Australian modem market can't resist the global trend towards mega-mergers. NetComm and Banksia Technology have announced plans to merge their analog modem businesses, creating Australia's largest communications equipment manufacturer.

Under the merger, Banksia will become one of four brands offered by the combined entity (along with NetComm's own brand and Banksia's Simple and Dataplex sub-brands). Former Banksia managing director David Stewart will become managing director of the newly-combined firm.

The estimated income of the company will be around $70 million; Banksia, which was privately held before the merger, was valued on its own at $15.9 million. The firm plans to spin off NetComm's cable modem business Aurora Communications as a separate operation following the merger.

***APC* Staff**

VALUE ADDING IS THE KEY

Resellers feel the squeeze

Businesses which sell technology equipment without offering a significant value-add are rapidly disappearing from the marketplace, a new survey of the Australian reseller community has found.

In 1996, the percentage of the overall IT channel acting in a consulting or development capacity sat at 20%, according to the Inform Business Development study, *Australian IT Channel Activities Report*. In 1997, it jumped to 26% — the only one of six market segments to experience substantial growth. At the same time, traditional, or non-value-added retailers and resellers declined by 3% each.

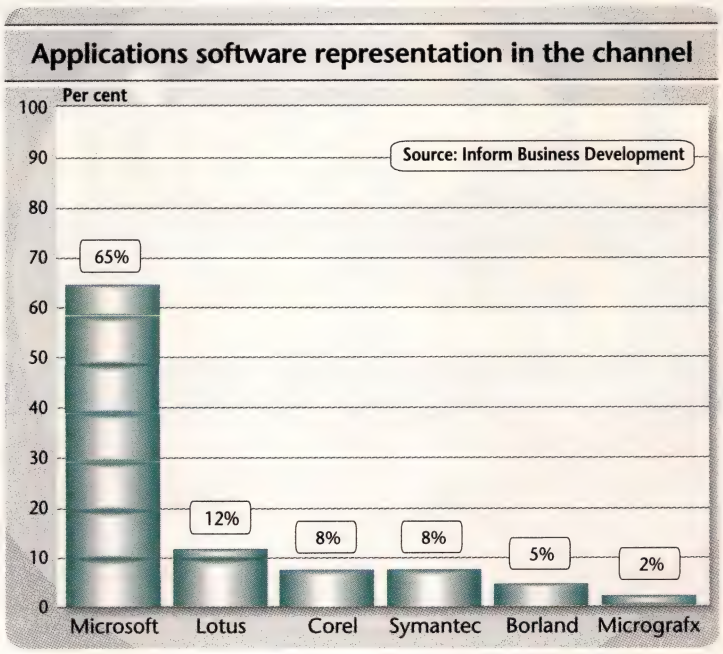
"In contrast to the volume market, the 'value providers' sector of the Australian IT channel has grown considerably, confirming that many channel organisations are turning to service-related business, as opposed to reselling third-party products," the report said.

Despite the importance of value-adding, a handful of companies dominate most aspects of channel activity. Microsoft seems almost unassailable in this regard; 65% of channel companies surveyed represented Microsoft applications, more than five times the nearest competitor (see graph). In addition, for the first time, more channel businesses offered support for Microsoft's Windows NT than Novell's NetWare. Microsoft also dominated development software mindshare, with 45% of channel partners favouring Visual Basic and an additional 32% opting for Access. (It should be noted that channel preferences do not automatically equate to market share.)

Other key findings from the report include:

- The PC channel is dominated by Compaq and IBM, who account for 30% and 22% of representation respectively. In the mobile segment of the market, Toshiba has 30% of market representation, followed by NEC and Compaq on 18% each.
- The printer market remains largely a Hewlett-Packard proposition, with 34% of businesses surveyed supporting and selling HP printers. Runners-up include Canon, Epson and Lexmark.
- Mid-range systems preferences are more evenly spread, with Digital, IBM and HP running neck and neck with shares of 27%, 26% and 23% respectively.

Angus Kidman



News Roundup

dominating the browser market might leave Redmond in effective control of the world economy, but it has also begun investigating Network Solutions, the firm responsible for commercial allocation of domains in the US. Network Solutions is not expected to retain control of that function when its contract expires.

⊕ Lots of coverage and not much excitement was the end result of US president Bill Clinton's highly-hyped speech on electronic commerce. Clinton endorsed the findings of the US Framework for Global Electronic Commerce, including a recommendation that online transactions between nations not be taxed. This is a sensibly pragmatic viewpoint, given that taxing such transactions would have been a near-impossibility in any case. A recent report estimates the value of lost taxation through Net sales in Australia to be $600 million.

⊕ Latest Net study: newly-established local research firm Sofres:IMR estimates that 2.85 million Australians are now online, and 39% of users have only connected in the last three months. An IDC study has also found that 70% of large corporations now have intranets.

For regular updates on what's happening in the world of computing, check out *APC's* Highlights From The Wire every Monday at http://apcmag.com/ direct/.

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Subscription prize winner announced

APC conducted a promotional/subscription campaign between 26th February and 5th June 1997. All subscriptions and renewals during this period were automatically entered in the draw. The winner, Shirley Elrick of Frankston in Victoria, renewed her subscription to *APC* on April 2, 1997.

The prize was a Toshiba Tecra 740CDT notebook computer valued at over $12,300. This high-performance Tecra 740CDT has the largest display of any notebook on the market, a 13.3in TFT active matrix colour display with a high resolution of 1,024 by 768. The machine is powered by an Intel 166 MHz Pentium processor incorporating MMX technology and features a 10x CD-ROM drive as standard. It is also covered by a 3-year comprehensive warranty for parts and labour.

ISPs WON'T BEAR BRUNT

New Net regulation agenda

Internet service providers have breathed a sigh of relief at the Howard Government's announcement of an online content regulatory framework that recognises that ISPs cannot be responsible for all material carried across their networks.

The framework asks ISPs to develop codes of conduct in conjunction with the Australian Broadcasting Authority (ABA), which would then be responsible for investigating unresolved complaints between ISPs and customers.

It carries echoes of the recent German multimedia law, which holds ISPs responsible for material hosted on their servers, but frees them from third-party responsibility if "blocking its use is both technically possible and can be reasonably expected".

The German and Australian policies differ in enforcement, and in the treatment of material held on ISP servers. Where the German law seeks legal retribution for infringement, Australia will seek to resolve issues first through self-regulation and codes of conduct, and then via the Australian Broadcasting Authority, which can resort to legal action if necessary.

Additionally, it appears that Australian ISPs will not be held responsible for material on their servers if they can demonstrate that they were not aware of it, and acted to have it removed when it was brought to their attention.

In a press statement, Minister for Communication and the Arts, Senator Richard Alston, said that "online services should not be subject to a more onerous regulatory framework than offline material", adding that the framework "balances the need to address community concerns [while ensuring] that regulation does not inhibit industry growth and potential".

The Australian Information Industry Association (AIIA), along with a number of prominent ISPs, has come out in support of the framework. AIIA acting executive director Rob Durie said that it was a "sensible balance between community concerns and business concerns". He added that the AIIA intended to "examine the [framework] materials in more detail" before making an official response to the government.

Not all bodies have reacted so positively, however. Kimberley Heitman, chairman of online advocacy body Electronic Frontiers Australia commented: "The whole concept of making service providers responsible for content is bizarre. It is as senseless as making paper-makers responsible for books published using their paper."

In related news, Internet industry bodies INTIAA (Internet Industry Association of Australia) and the AIA (Australian Internet Alliance) have joined forces to form the Australian Internet Council (AIC). The AIC's formation was spurred by the realisation that the Internet industry needed to present a unified front in the face of increasing regulation, said INTIAA chairman Richard Cousins. Previously, AIA had tended to attract membership of smaller ISPs deterred by INTIAA's high membership fees. INTIAA membership, accordingly, was composed primarily of large ISPs and content houses such as News Interactive. Cousins went on to say that "sex and taxes" were the two biggest issues facing the industry today.

Josh Gliddon

SYSTEM ON A CHIP

Merger changes processor scene

Intel faces its greatest potential challenge yet in the PC processor market, following the surprise announcement that two of its competitors — Cyrix and National Semiconductor — will merge in a $US550 million stock swap.

The merger came at a key point for Cyrix, which posted a loss of $US5.3 million in the last quarter. In contrast, National Semiconductor earned $US61.9 million.

Through the merger, Cyrix will gain access to a broader pool of funds, research facilities and manufacturing plants, although in the short to medium term it is expected to continue manufacturing its processors through IBM Microelectronics. According to National Semiconductor officials, Cyrix will likely be maintained as a separate operating unit of the company.

While approval of the merger isn't expected until November, the two firms have already begun talking up their combined technology plans. "The unique combination of technologies resulting from the merger gives us all of the building blocks to provide complete system-on-a-chip solutions for sub-$500 PCs and a broad range of low-cost information appliances," said National CEO Brian Halla in a statement announcing the merger. While National Semiconductor has said it has no plans to compete directly with Intel in high-end processors, Intel has made no secret of its desire to sell processor products into the low-end NC and appliance marketplace. The fact that Intel announced major price cuts on its chips the same day as the merger, led many analysts to speculate that it is feeling the heat of increased competition, especially for entry-level systems, where brand is considerably less important than price. However, with a profit of $1.6 billion in the last quarter, it seems clear that Intel can cut its margins with relatively little corporate pain.

Angus Kidman

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APC-FM3-09/97

National IT strategies may be about to kick into high gear.

Children of the revolution

Prime Minister John Howard's recent desire to place the development of an IT strategy on the top of the government's political agenda was well timed. While many reports have been written on the subject (and most have already stressed that a greater role for government is needed to push the industry forward), three more are about to pass the recently IT-enlightened Howard's desk.

Howard has finally seen the IT light after a visit to the technology-hip US, amid public criticism that the government has no answer for high unemployment and lacks the sense of urgency required to foster industry in Australia.

Howard believes he may have the solution: a more interventionist industry policy and a greater focus on information technology. In the next few months, after reading a few well-timed reports and consulting with relevant industry associations, business, consumer and government representatives, Howard will outline his IT vision for the future.

Such talk and policy direction is better late than never, according to industry associations and business representatives, who have been lobbying this government and the previous government on the benefits of a healthy and competitive IT industry.

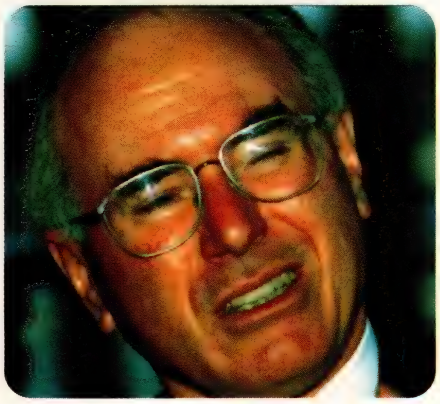
To date, such representations have had little apparent impact. Australia's IT exports dropped from $1 billion in 1995 to $800 million last year, and earlier this year the federal government scrapped the computer bounty, thereby eliminating about $50 million per year in industry assistance.

The Howard government certainly can't plead ignorance in this respect. Earlier this year the Allen Consulting Group produced a report titled *Spectator or Serious Player? Competitiveness of Australia's Information Industries*. It clearly stated that the federal government needed to make extensive, immediate and catalytic policy changes to ensure Australia was a competitive player in the global IT industry. It noted that although Australia is the second largest IT market in the Asia-Pacific region, it lags in terms of production and exports.

Representatives are optimistic, though, that Howard and his advisers will take note of recommendations found in three more studies of IT industry development: the Mortimer, Goldsworthy and Information Policy Advisory Council reports. The Mortimer report had been released at the time of writing, and the other two were expected to be handed to the relevant ministers 'shortly'.

The Mortimer Report, (*Going for Growth: Business Programs for Investment, Innovation and Export*) was the first of the three reports released after Howard's 'conversion'. Written by TNT chief executive David Mortimer, the six-month review of industry assistance recommended that the government aim to double Australia's per capita income growth from 1.7% to 3.4% a year over the next 10 years.

This would be achieved through such schemes as a $21 billion, five-year strategy to restore the government's industry assistance strategy, a $1 billion Invest Australia fund to boost foreign investment and attract new technologies, the liberalisation of foreign investment rules, the introduction of investment incentives and changes to research and development assistance. (Selected parts of the report can be found online at http://www.dist.gov.au/events/mortimer/index.html.)



Mortimer recommended that the current range of business programs be curtailed to a suite of five; that all programs conform to key principles, and that innovation programs be standardised; that the main export programs be retained, but adjusted to improve effectiveness; and that access to programs be eased by focusing their delivery and cutting the number of organisations involved

Mortimer recommended cutting the 125% R&D tax concession to 100% and establishing an innovation rebate — he suggests in the report that a simple, equitable program is required, "with the same rate of support to eligible activities regardless of product, size or tax status". The innovation rebate would be 14 cents in the dollar for profitable companies, and those in tax loss could get the 14 cents in the dollar and keep the concession or choose to take a dollar-for-dollar rebate.

The Australian Information Industry Association (AIIA) welcomed both Howard's conversion and the recommendations of the Mortimer report. It said the PM now needed to consult with industry on strategy implementation. In the AIIA's vision, such a strategy should include the creation of a supportive infrastructure for the digital economy, government leadership in using IT to deliver services, and the attraction of major development projects to build on and develop local capabilities.

The Australian Computer Society's vice-president Prins Ralston welcomed the recommendations of the Mortimer review, and encouraged the Howard government to look seriously at implementing the reforms. He said that the government had made little progress on establishing a viable IT industry to date, but this report provided the chance to set a clear and sensible direction. The Australian Electrical and Electronic Manufacturers' Association also supported the report's recommendations.

Government reaction to the report has been mixed, with Industry Minister John Moore saying in a press release that it raised significant issues which would provide a valuable input to the debate. Others were more wary, particularly about setting targets for growth.

There has also been discussion in industry and political circles regarding the Goldsworthy and IPAC reports, even though, at the time of writing, neither had been released. A draft version of the Goldsworthy report has been in circulation, however. While Professor Goldsworthy would not comment on the report's content before its release, it is said that the report's recommendations include cuts in corporate and capital gains taxes to attract foreign investment, a 200% tax concession for R&D salaries, tax holidays for foreign investment, and an industry development schemes merger.

The Information Policy Advisory Council is in the final stages of preparing its paper, which will aim to provide a strategic framework for online services. Howard has indicated that the Internet will be an integral tool in the reshaping of the Australian economy.

Selina Mitchell

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Will the browser war be won and lost through content alliances?

Push to score Aussie Net content

Forget the World Wide Web — for local publishers and software developers, the Australia Wide Web appears to have become the central focus. Netscape and Microsoft are racing to sign up as many local content partners for their respective channel browsing systems as possible. And while those 'push' deals are currently the most prominent, a host of other initiatives are being undertaken by the two companies in a bid to increase user numbers.

Microsoft has begun announcing Australian content partners for the Active Channel, which will form part of Internet Explorer 4.0, set for release by the end of August. The first group of local partners include the Seven Network, the APN Computing Group, the ABC, Fairfax, News Limited, X-Stream and Publishing Broadcasting Limited (PBL is the parent company of *APC*). A statement from the company said that negotiations are still underway with other major Australian companies, and further announcements will be made. Internationally, Microsoft claims to have signed up around 250 content providers (although this list includes multiple titles from single publishers).

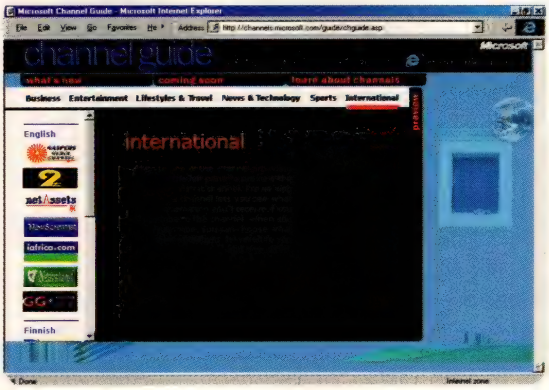
Details of planned channel content from local firms are sketchy so far. APN plans to provide a daily news service and gaming hints, although the former will largely be based on content from US publisher Ziff-Davis, which has also signed onto the Active Channels program. X-Stream will provide access to demos, gaming hints, reviews and news.

None of the other partners had made any full formal announcement of their exact content plans when *APC* went to press. While most of the partner companies already enjoy a Web presence, this may not always translate directly into suitable channel content. News Limited, for instance, has focused most of its online efforts on its Newsclassifieds site, rather than news or feature content.

Significantly, none of the local content partners had been added to Microsoft's online channel guide when this story went to press.

Nonetheless, Microsoft remains verbally committed to the importance of local content partners. "We're making a very big investment in making sure we totally customise for Australia," said Internet platforms and tools product market manager Harvey Sanchez. Sanchez hopes that the release version of IE 4.0 for Australian users will automatically set these key content providers as part of a user's default selection of available channels.

While Netscape hasn't named any local content partners for Netcaster to date, it already has a push facility in the form of its Inbox Direct HTML mail service. Partners in that program include Fairfax, Sofcom, *The Australian* and *APC*, and Netscape hopes to sign up these companies and additional partners for Netcaster.



Although Microsoft is pushing for global content deals, content categorisation by topic is reserved for US providers.

Despite the rush by both companies to sign up local content providers, it seems that regional content is a relatively small blip on the long-term strategic radar. For instance, both Netscape's Inbox Direct and Microsoft's Active Channels dump all non-US content providers in a single unsorted 'International' directory; only US content providers are sorted into topic categories such as entertainment or technology (see picture).

Although push technology is the focal point in both Netscape and Microsoft's most recent browser releases, much of their local-content creation activity is centred on 'traditional' Web content and functionality. Netscape, for instance, recently announced a new set of partnerships with four search engine companies — Excite, Infoseek, Lycos and Yahoo! — to offer localised search services for Australian users via the local Netscape home page mirror. Excite is also offering a guided search service, known as International Netscape Guide by Excite, which will include links to selected local news and information services. The service is scheduled to debut later this year. The fact that Netscape's substantial local presence makes it easier to offer these sevices hasn't escaped Microsoft. According to Sanchez, Microsoft is working on a full local mirror of the main Microsoft site, although few details on the project are forthcoming. One of the features Microsoft is promoting in IE 4.0 is access to a range of search services from a floating panel. There will be a degree of local customisation in this feature; for instance, customers who select the Alta Vista search option in IE 4.0 will automatically be routed to Telstra's Australian mirror of that site.

A third prong to Microsoft's local customisation offering is partnerships with local ISPs to enable new Windows users to immediately sign up for Internet services. A number of new partnerships in this area will be announced shortly, according to Internet customer service group marketing manager Phil Meyer. One of those partnerships will be with AT&T, he said. Another is expected to be with Microplex, which has set itself up as a national provider in recent weeks by acquiring Pegasus and AUSNet. Existing partners in the program are Telstra Big Pond, OzEmail, Access One and the Microsoft Network.

A final angle for Microsoft, is a Sydney and Melbourne version of its Sidewalk city information service. The Sydney service has been in the planning stage for almost a year, and will debut later this year or early next year. Melbourne is not expected to be online until early 1988.

Angus Kidman

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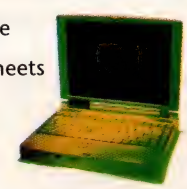

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This year's PC Show has been revamped in an effort to be all things to all people.

PC shows take on a new face

The PC Show is about to hit Melbourne, this time taking on a new name — PC IT 97: The Global Computer Communications and Networking Exhibition — in an attempt to reflect the convergence of computer and communications technologies. In addition, concept areas will be extended in preparation for a complete rollout in Sydney next year, where there will be five pavilions covering NT, Java and Development; Human Resources, IT Recruitment and Professional Services; Communications; Accounting Systems and Financial Systems Services; and Web Development.

The refocus is part of AES's plan to make its exhibition the only viable option for both exhibitors and visitors. Exhibition director Gordon Whiteside said the IT industry cannot support a new exhibition every time an emerging technology is commercialised. "In the end, there would be no reason why an exhibitor would want to participate in any other show other than PC IT," he said.

Whiteside believes that by providing a definitive umbrella event covering the major IT areas, AES will cover the niche markets that to date have been served by many smaller shows.

The new focus comes as AES announced it will no longer stage The Home Computer Show. The reason given was poor visitor response, forcing it into retirement after just five years.

The Melbourne show will feature free daily seminars on IT issues, and keynote addresses by industry leaders, including Compaq's Ian Penman and Oracle's Dr Paul Burrin. Special showcase features have been enhanced, with an increased emphasis on communications, networking, the Internet and multimedia.

In line with the show's broader focus, this year will see an increase in the number of vertical market exhibitors. Melbourne-based law practice White SW Computer Law is exhibiting for the third time, along with Intech Credit Union, while Pink Panther Corporate Print and Australian air Express are new to the exhibition. The Department of Education is using PC IT 97 to publicise a number of new initiatives including NetDay, a program with a plan to network 4,000 to 5,000 classrooms in government schools throughout Victoria; and the recently launched WebSpinners, a work experience program in the multimedia industry for people aged 16 to 19.

Modem manufacturers will be out in force, fighting the battle between the two competing standards, K56Flex from Rockwell and x2 from US Robotics and 3Com. NetComm claims to be the only manufacturer demonstrating both solutions. Other companies displaying 56K modems include Aus.Linx International, Lectron, Modem Superstore, 3Com, Rockwell and Banksia.

Storage solutions are the focus of many stands. Imation is displaying the SuperDisk LS-120 'disk'. The size of a 3.5in disk, it holds the equivalent of 83 standard disks. While pricing had not been released in time for this issue, industry sources say the drive will sell for around $250, and the disks around $20 each. The drive is backward compatible, so it will still read normal 3.5in floppies. Sony is showcasing its latest data storage solution, the Advanced Intelligent Technology tape drive for high-end users, which can capture 50M of data on a single tape at a rate of 6M per second. Agate Technology is demonstrating the new Elite drive for high-performance notebooks with a 23G storage capacity.

As expected, Web-based products will be present in force. Compsys is demonstrating its new categorising and ordering system which enables suppliers to insert or update product details which immediately appear in the online catalogue. Hotspace Australia has a new product that allows businesses to create and maintain their own Web site, and make unlimited modifications at no cost. Web designers participating in the show include Perth-based Chromium and Galileo Publishing.

Electroboard is demonstrating Video Flyer, which the company claims is the world's first computer-free and computer-based video conferencing unit. Other exhib- itors displaying the latest in visual technology include Canon, Epson, Hewlett-Packard, Lako Vision, Sanyo, Sharp and Sony.

Notable absences are from Internet services providers, particularly OzEmail, which boasted the largest stand in the previous two shows.

For the first time, visitors can register their interest in a particular product range at the electronic information booths, where they will receive a printout of companies marketing those products, together with a grid-referenced floor plan. And don't forget to call into the *ACP* Computer Publications stand and take advantage of discounts on our latest issues and special show subscription offers.

PC IT 97 is being held at the Melbourne Exhibition Centre from September 2 to 5, and is expected to attract some 50,000 visitors over four days. Opening times are Tuesday 11am to 7pm; Wednesday 10am to 7pm; Thursday 10am to 9pm; and Friday 10am to 5pm. Admission is $20, but if you contact any of your suppliers you'll be sure to score a free ticket. For further information, see the Web site http://www.ausexhibit.com.au.

Cathie Kennedy

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Service pack or significant upgrade?

Microsoft Windows 98

Windows 98 is going to be released into a vastly different world from the one that greeted Windows 95 in August 1995. Back then, users had the choice of using either the DOS window dressing that was Windows 3.x, opting for a Macintosh-based solution, or using NT 3.5x if full 32-bit capability was required.

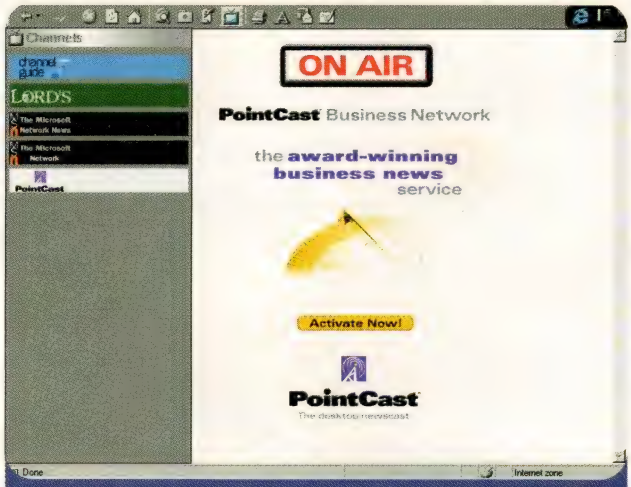
Now the Internet is much closer to reaching a critical mass, changing the paradigm of personal computing through greater connectivity. The ideological war between Mac and Windows appears to have been won, with Apple retiring to lick its wounds, and corporations are being presented with the option of moving back to centralised computing via some variations on the NC concept.

Even Unix, which was confined to the higher end in 1995, is now an option for savvy PC users through the growth, ongoing development and acceptance of Linux. Essentially this means that while there's greater choice for some users, for others, primarily domestic users, the choice is going to be restricted to Windows 98. It also means that people are going to be more jaded about the prospect of a new Microsoft operating system, and even Microsoft can't pitch the new OS as being as revolutionary to the Windows user base as Windows 95 was.

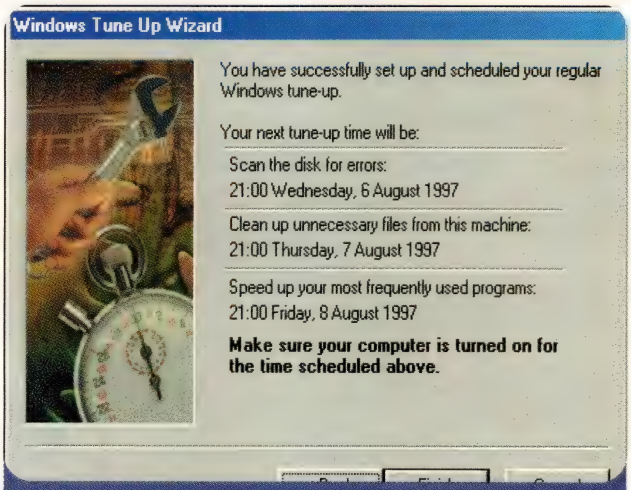
APC took a look at Windows 98 Beta 1, using shell integration and adding the latest available build of Internet Explorer 4 Platform Preview 2. We tested using a Digital Celebris Pentium 90MHz loaded with 32M of RAM. Also running on the system were Lotus Notes 4.6 Beta 1 and a mixture of other pre-release and commercial Win32 software.

Installing and setting up Windows 98 over the existing OSR2 version of Windows 95 was a pain-free affair completed in approximately 50 minutes, although this time will vary depending on the system used. Because Beta 1 comes with an earlier build of the Internet Explorer (IE) 4 suite, the latest build was installed, and this process was also incident free.

On the surface Windows 98 is disappointing, albeit less so for users unfamiliar with the IE 4 shell integration interface. The basic message is that if you've seen IE4 shell integration, you've seen the Windows 98 front end. We were impressed by the basic user interface enhancements like single-click launching and Web view of folders, however others have pointed out that some users, especially those unfamiliar with the Web, are going to have trouble adapting to the new paradigm. Corporations already standardised on Windows 95 are also more likely to opt to stay with the existing interface while others yet to make the switch to 32-bit will probably opt for the enhanced interface.



The Windows 95 Channel view.



Making your machine run faster: the Windows 98 Tune-up Wizard.

Microsoft has changed the appearance of some icons slightly, with colours appearing sharper and detail a fraction more defined. Users opting for shell integration will also appreciate the greater flexibility offered by multiple toolbars that, unlike the basic Win95 taskbar, can be positioned wherever required on screen. These toolbars include an address bar — type in a local, network or Internet address and up pops IE4, displaying the appropriate information — as well as a desktop content bar and an application quick launch bar.

Of perhaps less immediate interest is the Active Desktop, which can display and execute ActiveX, Java and other content. For Microsoft the Active Desktop is a content Trojan horse, being the home of the channel selector and the digital TV tuner on which Microsoft's push content strategy rests. The majority of domestic users will be unable to take full advantage of the push channels unless they have a permanent connection to the Internet. Net-savvy corporations may want to configure the channels to display corporate information across an intranet, and they will also appreciate the desktop lock-down capabilities built into Windows 98.

Other minor aesthetic enhancements include dialogs that 'expand' from the click point instead of just appearing, and additional maximise and minimise icons on right-click dialogs.

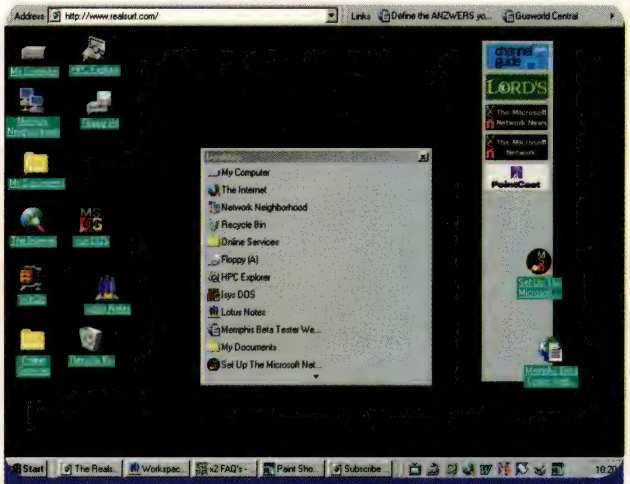
Beta 1 includes most, but not all of the features that are expected to be included in the final release. One of the most attractive is the disc defrag optimiser, which puts frequently accessed applications and data in contiguous blocks on the hard drive, the upshot being that it takes less time to execute an application. Spinoff effects of this optimisation should include longer hard drive life and less noise, but with the reliability and silence of modern drives, few users will notice tangible benefits from this. After configuration and approximately two days use, we noticed execution times had fallen on frequently used applications like Word and IE, but paradoxically, Lotus Notes 4.6 B1 ran slower, and launch time was not noticeably improved over that of Windows 95.

The defrag optimisation tool is part of a suite of system optimisation tools accessed from the Start button. These tools can be scheduled to optimise disk access, to scan, defrag and fix drive problems, and to eliminate unnecessary system files.

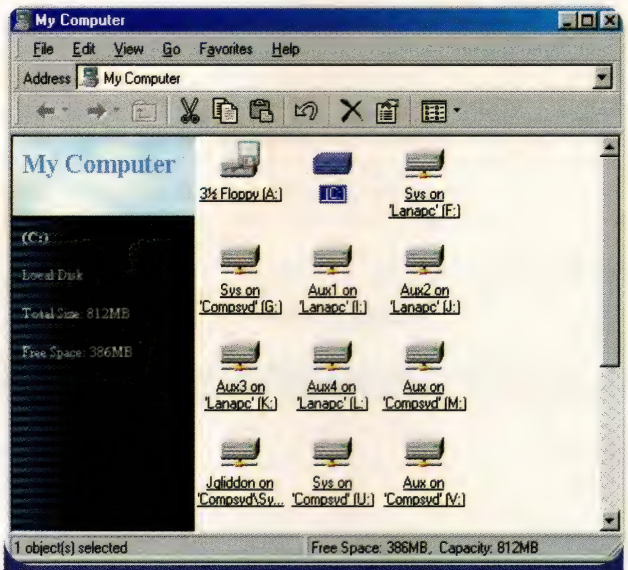
Other applications, such as ISYS for DOS, WinZip and Norton Commander, also ran without a hitch under Windows 98, however users need to be careful with utilities that aren't optimised to handle FAT32-formatted drives. Windows 98 includes a conversion tool to convert drives from FAT16 to FAT32, the main benefit of which is smaller cluster sizes and support for single drive volumes up to 2G. While it's not possible to return to FAT16 after the conversion except by completely reformatting the drive, users are not forced to migrate to FAT32 when installing Windows 98.

Other productivity applications like Microsoft Office 97 ran without a hitch. The move towards the USB peripheral standard is supported in the beta, as is support for 1394 technologies. USB support is designed around the Win32 Driver Model (WDM), which creates a common driver model for most peripherals for both Windows 98 and Windows NT.

It's also worth bearing in mind that Windows 98 comes with its own groupware platform (IE4) meaning that mail, news, Web authoring and collaboration tools are now part of the operating system. This conforms with Microsoft's trend towards building into the operating system functions that were previously left to third-party developers.



The Windows 98 Active Desktip.



Folder views are transformed into customisable Web pages.

The Digital TV tuner was among the only features not included in this beta. The tuner is optimised to handle DSS (Digital Satellite) and NTSC broadcasts, as well as enhanced broadcasts that include content additional to the regular programs. Microsoft states the tuner can handle up to 320G of data per day, however with Australia's lack of digital broadcasting, and our incompatible PAL TV system, Microsoft will need to localise the technology for it to be of any use to Australians.

Also missing was the 'sleep' capability, which is a component of the "On Now" initiative designed to ease administration problems and also reduce the amount of time it takes the computer to boot into the operating system after it has been switched on.

Windows 98 was surprisingly stable for an early beta, especially considering it was running in a volatile environment in conjunction with other beta software. During the crashes *APC* experienced, Windows 98 was successful in isolating the offending application and shutting it down. There were no fatal crashes.

The difference made by the defrag optimiser was also very impressive, loading applications noticeably faster than under Windows 95. *APC* also noted that the performance improved over the course of several days, reaching top performance after about three days of constant use.

Overall, Windows 98 is a promising improvement on Windows 95, but it is not a revolutionary upgrade. Users looking for an operating system that is going to push the technological envelope are going to be disappointed, but BeOS and Linux exist for these thrill seekers. For everyone else the question of whether to upgrade or not come release time will centre on whether the additional features are useful, and how much it costs. With IE4 free, the under-the-hood changes amount to a meta-service pack for Windows 95, which means that to entice users to upgrade, either the OS enhancements or the pricing is going to have to be sufficiently compelling. Microsoft has not announced pricing or final availability.

Josh Gliddon

Microsoft Windows 98

Distributor	Microsoft
Phone	(02) 9870 2200
Online	http://www.microsoft.com
Price	TBA
In short	Some useful new features are included, but probably not enough to temp users if it is a pricey upgrade.

APC Labs tested the two latest and fastest Socket 7 microprocessors on the market to see how they matched up against each other.

Intel Pentium 233 MMX and **AMD** K6/233

It could be said that a year ago Intel had almost no competition in the processor market. This is not so true now with AMD making inroads into the desktop marketplace, supplying faster and more powerful processors. However, AMD's initial release of the K6 was hampered by supply shortages, so systems running the processor were few and far between. AMD has assured *APC* that it has overcome these problems and K6 processors are readily available in all speeds.

National Semiconductor, (which recently purchased Cyrix) has defocused from the x86 processor market, concentrating more toward specialised controller and low-end processors, a move which will leave AMD and Intel to slug it out over the coming months.

AMD will have faster versions of the K6 available by the end of this year. According to Terry Lim, AMD's Business Development Manager in Australia, we should see the 266MHz version of the K6 early in the fourth quarter of this year. Depending on the yields obtainable by AMD's fabrication plants, a 300MHz K6 may appear on shelves and in systems by Christmas this year.

While it looks as if the 233MHz MMX Pentium processor will be the last socket 7 chip from Intel, rumours abound about the possible release of a 266MHz version early next year. Intel has also announced the pending release of the 'Tilamook', a 0.25 micron, ultra low-power Pentium MMX processor designed for notebook computers.

According to our test results, the K6 was the faster chip when it came to 32-bit processing. Almost 100 points separated the K6 from the Pentium in both of the CPUMark 32 tests. Interestingly, the K6 and the Pentium 233 were on a par when running 16-bit code in the CPUMark 16 test.

While the AMD was the fastest in our CPU and application tests, the Pentium 233MHz was the better performer in MMX tests. Under both the Intel Media Benchmark and the Norton Multimedia Benchmark MMX tests the Pentium was clearly more proficient.

At the time of writing there were only a few systems available with these processors. Gateway and Dell have 233MHz Pentium systems, while smaller component assemblers had limited K6 systems ready to deliver. If you are intending to upgrade to either processor you will have to ensure that your motherboard will be able to cope. For the K6, the motherboard must clearly support K6 processors, (this may require a BIOS upgrade). If you want to find out if your motherboard can handle the 233MHz Pentium, look in your motherboard manual to see if your board supports P55C (Pentiums with MMX technology) and the 233MHz speed. If you are not sure, contact your motherboard or system manufacturer for more information.

Both prices quoted are tax inclusive and based on rates charged to OEMs for batches of 1,000 units.

Lachlan Botticchio

Intel Pentium 233 MMX

- **Distributor** Intel
- **Online** http://www.intel.com.au
- **Price** $516
- **In short** While not possessing as much processing power as the K6, the 233MHz Pentium incorporates better MMX execution than its competitor.

AMD K6/233

- **Distributor** AMD
- **Online** http://www.amd.com
- **Price** $520
- **In short** The fastest socket 7 processor on the market today.

How they compare

	AMD K6/233 MMX	Intel Pentium 233Mhz with MMX
Windows NT 4.0		
CPUMark 16	450	454
CPUMark 32	544	450
High-End Winstone 97	24.7	23.8
Business Winstone 97	58.4	55.8
Windows 95		
CPUMark 16	465	467
CPUMark 32	563	460
High-End Winstone 97	24.4	23.6
Business Winstone 97	55.2	52.1
Intel Media Benchmark*	255.18	295.06
Norton Multimedia Benchmark*	12.9	15.5

* Denotes that benchmark tests MMX performance.

The two processor chips were tested under identical conditions on the same system. Both processors were tested on a system with the following specifications:

FIC PA-2011 Motherboard
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Matrox Millennium 4M Graphics Accelerator
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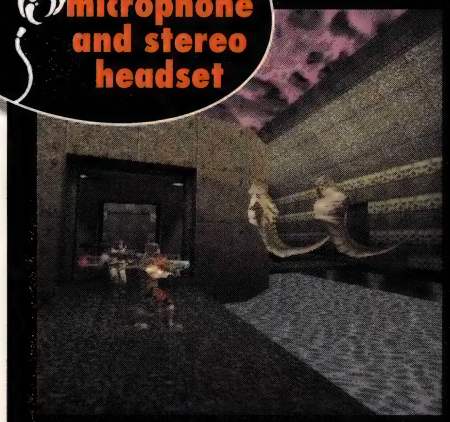

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In the face of an increasingly popular Windows NT, Novell's newest NOS will contain a host of features to shore up its threatened market share.

Novell Moab

In an effort to stem the growth of Microsoft's NT network operating system (NOS), Novell is to release a new version of its NetWare operating system, currently codenamed Moab. *APC* took a look at Alpha 1 of the product.

NetWare has long been the NOS of choice for file and print serving, but due to the use of NetWare Loadable Modules (NLMs), poor memory protection and proprietary networking protocols, it has given way to Windows NT for client/server and intra/Internet applications in recent years.

According to Novell, over the next four years the growth of the intranet is set to outpace that of the Internet by six times. In order to win intranet market share, Novell has had to redefine its strategies and reposition its NOS as a set of services for Intranets. This translates to a solution that encompasses the advantages of the Internet, with its platform-independent architecture and wide area accessibility to data, with those of traditional LANs, with file and print sharing, high security and reliability.

Improvements in the latest version of IntranetWare are focused on improving the intranet and distributed application server aspects of the NOS. To achieve this Novell has reworked the OS kernel, memory architecture and network protocols, and adopted open Java standards.

The multiprocessing kernel (MPK) used in Moab negates the need for the symmetrical multiprocessing (SMP) NLM and provides support for both uniprocessor and multiprocessor systems. The MPK enhances the native NetWare scheduler with multiprocessing capabilities and allows for multiprocessor Java thread support. A new scheduler allows the administrator to specify applications that have been written to the MPK specification to be given increased priority for CPU time.

The MPK kernel is backwards-compatible with current NetWare, IntranetWare and NetWare SMP.

To date the memory architecture used by NetWare has not had the fault tolerance required for a distributed application server environment — a poorly written NLM could take the whole server down. The new Virtual Memory and Memory Protection features allow applications to access virtual memory and to run in a protected memory space safe from rogue NLMs.

In previous versions of IntranetWare, the NOS was reliant on NetWare/IP for IP connectivity. NetWare/IP enabled IP connectivity by encapsulating IPX packets within IP packets. With Moab, support for native IP, the NOS is no longer reliant on NetWare/IP. IntranetWare networks with native IP can be implemented using either the IP or IPX protocols, or a combination of both. The Moab Alpha Release 1 software was limited to IP-only implementations. Moab also provides support for the Windows Socket Version 2, Secure Sockets Layer Version 3 and the Lightweight Directory Access Protocol (LDAP).

The NetWare Over TCP/IP environment allows IntranetWare core services to utilise the IP environment as it would an IPX environment. In order to support both IP and IPX protocols, the NetWare Core Protocol (NCP) verb engine is no longer dependent on the IPX protocol and can place NCP packets in either IP or IPX packets.

In IP there is no equivalent of the Service Advertising Protocol (SAP) or Bindery. To overcome this, the Novell Directory Service (NDS) replaces the SAP and provides the name services — calls previously made to the Bindery name service should be redirected to NDS. The address of an NDS server is provided by the Dynamic Host Configuration (DHCP) service, which also controls address leasing. By integrating the NDS with the DNS, the NDS can be used as the names store for other services.

As part of Novell's move to an open platform the plan is to integrate a Java Virtual Machine into future releases of Moab. This will allow platform-independent Java applications to be run on the server and remove much of the dependence on the NLM architecture. Other features planned for Moab (but not appearing in this alpha) include Novell Storage System, Novell Replication Services, Novell Distributed Print Services, IPv6 support and a new installation process.

Installing the alpha of Moab was relatively easy, although getting a client to connect to it was not. We installed Moab in the *APC* Labs on a Digital Celebris XL with 32M of RAM, a 2G IDE drive and 3Com Etherlink 3c509B Network card. The installation process was uneventful — the only user intervention required was to supply the server name, IP address and netmask (which had to be entered in hexadecimal notation) and NDS tree information. Once the server was up and running we loaded and configured the DHCP NLM.

We originally installed the IntranetWare client on a Digital Celebris FX-2 running Windows 95B. We could ping the server but could not get the IntranetWare client working properly. We reformatted the drive and installed Windows NT Workstation 4.0. Only TCP/IP was installed on the workstation with a fixed IP address.

Connecting to the server was a little challenging. We had to use the IP address of the server, in the preferred server field of the login prompt, as the client software was unable to access the server using the server name. This should be fixed with the introduction of the Service Location Protocol (SLP) which will allow the client to map host addresses to network services.

We configured the DHCP server with limited success. The first IP address in the default pool of IP addresses was the address of the server. This was the address leased to the client and, needless to say, it didn't work too well. We reverted back to fixed IP addressing but were unable to get the client to connect to the server as the client was using the server name in preference to the IP address and could not locate the server.

For an alpha, Release 1 version of the Moab NOS was reasonably stable. If Novell can integrate all the features planned, the platform might start to stem the tide of users moving away from Novell. Moab is scheduled for release in late 1997 or early 1998.

Stuart Bowman

Novell Moab

Distributor	Novell
Phone	1800 244 364
Online	http://www.novell.com/moab
Price	TBA
In short	If Novell can get Moab right it will prevent defection of many loyal NetWare users to NT.

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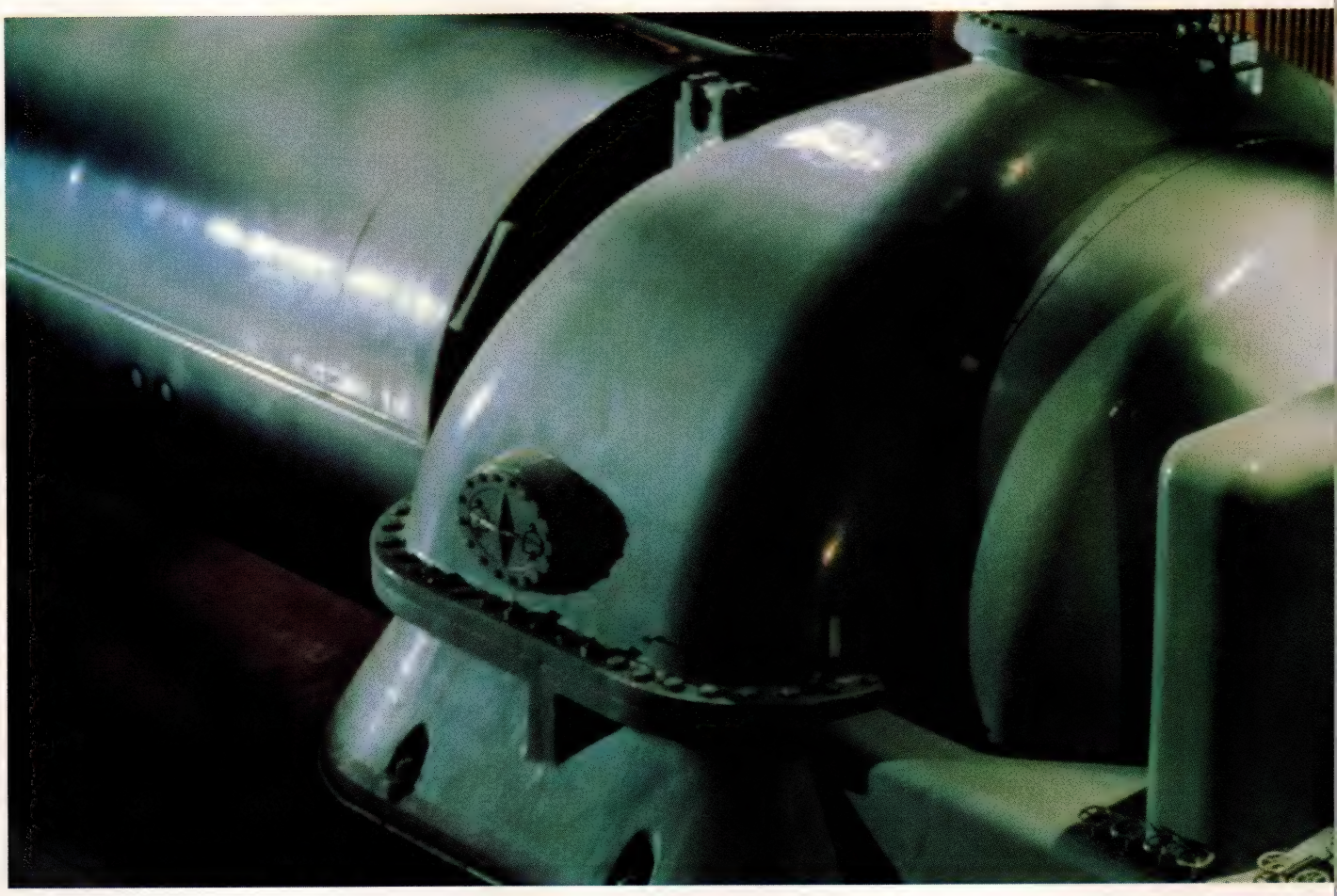

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Compaq LTE5400	1:47
IBM Thinkpad 760E	2:38
Toshiba Tecra 730CDT	2:37

*Results of a 'Battery Torture Test'. The longer bar indicates better performance. Source: Windows Sources Australia Magazine (Feb. 1997).

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A number of new features make this a worthwhile upgrade.

Microsoft Internet Information Server 4.0

Internet Information Server is an integral part of Microsoft's plan to dethrone Netscape as the Internet's dominant player. With the sudden, almost universal realisation that Net technology represents not merely a passing curiosity, but rather a lasting paradigm shift, the competition for supremacy in the browser and server markets has become more than a little fierce.

Microsoft's IIS has always been closely tied to its Windows NT operating system, and Version 4 (currently in beta) is no exception. For this reason, the various strengths and weaknesses of the NT environment are likely to be mirrored in the server, with the most common criticisms involving reliability and configurability. With Internet Information Server 4.0, Microsoft has gone to great lengths to answer these and other complaints, adding many features to create what appears to be a very impressive package.

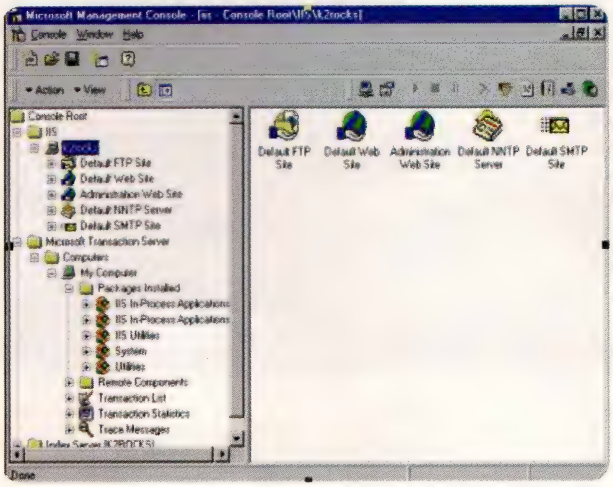
IIS 4.0 allows a degree of configurability that should satisfy most system administrators. A single server can be configured to host multiple sites, with separate control over bandwidth limits, ISAPI filters, logging, and any number of other parameters. At the opposite extreme, for larger setups, multiple servers can be configured to appear as one single logical server.

Server administration tasks can be performed via the system's Management Console, or remotely through a Web browser. The Console itself is an extensible container which can group together any number of 'snap-in' management applications. If the system has several administrators with different responsibilities, then each can have a customised administration console suited to his or her particular needs. Administrators can also automate tasks using ActiveX scripting languages, although NT has no rapid-development scripting language that can rival Perl or the Unix shell.

When it comes to reliability, Microsoft has demonstrated its faith in its own products by using Windows NT and IIS for http://www.microsoft.com, one of the Web's busiest sites. Unfortunately, some well-publicised crashes and lengthy waiting periods may have left doubts about the ability of the Microsoft OS-server combination to handle truly industrial-strength demand.

The new IIS addresses these concerns, and features some clever crash protection and crash recovery. All of the applications running on the server are quarantined from each other, so one dying app will not bring down the entire system. Furthermore, any application that does happen to fall over will be restarted automatically when it is next needed.

You may have heard IIS4 being called a 'transactional server'. This means that Web applications can be declared to be 'transactions', that is multi-part operations which must either succeed as a whole or be aborted as a whole. As a result, critical operations are never left half-complete.



IIS4 has numerous other features that can only be mentioned briefly in this article. These include:

- An ASP script debugger. This is a handy tool for analysing server-side scripts, and supporting single-step execution, breakpoints, and the ability to view the contents of variables in realtime during execution.
- HTTP 1.1 compliance. The new HTTP standard allows PUT and DELETE operations for remote file management, but more importantly, adds some vital performance enhancements. Persistent connections will let a client browser download all of the elements of a page without having to repeatedly close and re-establish connections (an enormous wasteful overhead). The server can also control the longevity of cached documents on an individual basis, to squeeze the last drop of benefit from your browser's cache.
- Robust ISAPI. The Internet Server API is much more efficient than normal CGI applications, because it does not spawn a new process for each request. Isolating ISAPI apps from the server application's space should allow developers to take advantage of ISAPI's efficiency, without compromising system reliability.
- Database Connectivity. IIS4 comes complete with ODBC interfaces for almost all major databases, including the new Performance driver for Oracle compatibility.
- Content rating. PICS ratings can be allocated to server sub-trees, or on a document-by-document basis.
- Customised error handling. Configure the server to deliver pages or run specific applications when particular errors occur. No more "Server Error 500" messages!

Feature for feature, Microsoft's Internet Information Server 4.0 is a match for any server on the market. The great test, however, will come when this new package is put to work in the real world. While it is relatively easy to assess the configurability of the system after a few days of investigation, the robustness of the Windows NT operating system and server can only be adequately tested over time, and under load. For now, though, it is clear that Microsoft means business. The pressure of subjecting their products to a very public trial by fire on the Microsoft Web site will undoubtedly result in ever-increasing power, performance and reliability.

Lee Borkman

Microsoft Internet Information Server 4.0

Distributor	Microsoft
Phone	(02) 9870 2200
Online	http://www.microsoft.com
Price	Free
In short	A significant upgrade for Windows NT users.

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Cross-platform programming made easier.

IBM NetRexx

When the C++ programming language recently experienced its popularity surge in the media and among computer circles, few non-programmers were tempted to run out and learn object-oriented programming. C++ increased the already steep learning curve of programming, but offered rewards in large-scale development.

The combination of the Web's popularity and applets on the other hand, has pushed Java into the public imagination. As a result, numerous products have emerged to simplify the creation of Java applets, trading functionality for ease of use. Until now there has been a large gap between the ease-of-use of applet automation programs and the functionality of raw Java. Enter NetRexx.

NetRexx is not a cross-platform language *per se* — it is a language for writing Java code. As such, NetRexx is constrained to the basic underlying structure of the Java language. In fact, NetRexx code bares a strong resemblance to Java code (see the comparison of the two languages).

With Java, the single most difficult aspect of the language is understanding object-oriented programming, and, due to NetRexx's reliance on the Java language, NetRexx retains the conceptual hurdle of working with objects. If you are looking for an easy scripting language to create Java applets, you are still out of luck. If, however, you are looking for a language that is more relaxed in its syntax, NetRexx may just be what you're after.

The NetRexx compiler is not a full-featured compiler, but a new front end to an existing Java compiler. NetRexx code is parsed by the compiler, producing a java file containing the actual Java source code for the program. The java file is then compiled by a separate Java compiler (most likely the JDK from Sun), producing the necessary class file. However, most of this happens transparently to the user. The PC version includes a batch file that calls the NetRexx program (a java class file with a long class path name), which does the parsing and then automatically calls the javac executable. A command line argument is also available to run the class file after compilation.

The downside to this is that NetRexx is not written using the AWT (abstract windows toolkit), which means that you have to be in a DOS shell to work with NetRexx. Installation and configuration has to be done manually as well, but the online documentation is quite good. And, if you are using Microsoft's Java SDK, make sure that you read the section on installing and using NetRexx with Microsoft's compiler.

The NetRexx language inherits the Rexx language's loose syntax and is closer to conversational English than other programming languages. To print the words 'Hello world!' to the screen, for example, the command would be, `say 'Hello world!'`, as opposed to the Java command, `System.out.println("Hello world!");`. NetRexx also hides some of the inner workings of Java, creating the correct class templates and importing the necessary packages. In a text-based program, for example, getting user input is much simplified in NetRexx, requiring only one command — `name = ask()`. The equivalent Java statement would initially require three steps:

```
import java.io.DataInputStream;,
DataInputStream myDIS = new DataInputStream(System.in);,
and try{ name=myDIS.readLine(); }
catch (IOException ioe).
```

If you're new to programming, or familiar with the Rexx programming language, the NetRexx syntax is much less daunting.

Creating applets, however, offers similar, but less dramatic improvements. NetRexx's dependence on the Java language prohibits radical departure where objects are concerned. NetRexx code looks less daunting (end of statement punctuation is not necessary, and statement grouping is not necessary) and makes it easier to produce syntactically correct code, but you still have to create constructors, understand inheritance, methods, properties, exceptions, and so on, to create original applets. If, however, your intention is to do a small hack job on an existing applet without needing to learn the language (and you can find NetRexx source to a similar applet), then NetRexx provides the perfect vehicle.

The main drawback to NetRexx is the dearth of resources available. Creating a fully functional, standalone program is less feasible than with Java. Java offers a number of professional packages that work within a window environment and allow developers to drag and drop window components (such as buttons and text fields) into place and add the code to handle those events. Further, most integrated development environments create most of the framework code for you, which slightly reduces one of NetRexx's advantages. Finally, while there is a good tutorial available on IBM's Web site, there are few books written on the language —

NetRexx versus Java

Here's an example of a typical 'Hello World' applet, written in Java

```
import java.awt.Graphics;
public class HelloWorld extends java.applet.Applet{
        public void paint(Graphics g){
          g.drawstring("Hello World!", 5, 25);
        }
}
```

And here's a functionally equivalent piece of 'Hello World' code for NetRexx:

```
class HelloWorld extends Applet
method paint(g=Graphics)
        g.drawString('HelloWorld', 5, 25)
```

IBM NetRexx

Distributor	IBM
Online	http://www.ibm.com/netrexx
Price	Free
In short	NetRexx is a great choice for creating simple applets and cross-platform text-based programs, but for serious development, Java is still the way to go.

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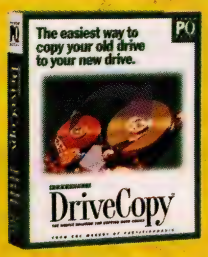

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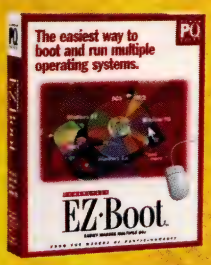

With full mouse support and a a simple, graphical interface, EZ-Boot makes it easy to install, boot, and run multiple operating systems on the same machine. And EZ-Boot supports all versions of today's popular OSs, like Windows 95, NT, Windows 3.x, Unix, Linux, OS/2, and DOS, so your favorite OS is always just a mouse click away.

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A tool to make the testing of your Web server that much easier.

RadView WebLoad 1.3

If the Internet is going to be used for serious business, some serious issues need to be considered. One of these is the ability of a Web server to deliver information at a rate satisfactory to users. These questions are no different from those confronted by database and network administrators on a day-to-day basis, but they now become the Webmaster's lot.

RadView's WebLoad 1.3 offers a tool to assist. Used in the quality-assurance stage of a Web site's development process, WebLoad performs Web site diagnostics to give an indication of how a site will perform before it is rolled out.

Designed to test Web sites for stress, WebLoad enables Webmasters to run and control unlimited numbers of tests generated remotely on networked multiple client workstations against unlimited numbers of Web servers.

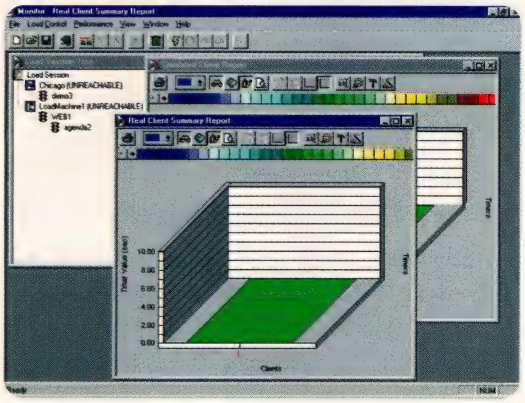
WebLoad records calls being requested by and issued to a Web browser. Typically these are requests for a URL or, with a form, a 'get' or 'post' command. These calls can be played back in an automated fashion to test the site. WebLoad is intelligent enough to be able to enter data into a form and randomly generate numbers.

Despite the fact that WebLoad claims to test Web application performance, for architectural reasons it is really only able to test Web server performance. A Java application either performs all transactions within the virtual machine or makes a separate socket connection to another application server and performs the direct I/O that way. For this reason, a future release of WebLoad will include a JavaLoad component. Non-Java-based Web applications that access a database via a transaction server would need to use traditional client/server testing software like Mercury Interactive's LoadRunner or Rational's SQA Suite.

WebLoad operates as a group of programs running simultaneously over several machines. The three main parts are the Load Server (to generate simulated clients that bombard the Web server), the Real Client (to run a single, live client) and the Monitor (to configure a test session and view the results). All machines need to run TestTalk, the network agent.

The Load Server starts and ends simulated client sessions and can simulate from 1 to *x* number of concurrent users accessing the Web server by manipulating the load size. On the one machine, the Load Server can simulate 10 users running 10 transactions every 10 seconds, or 20 users running 20 transactions every 20 seconds, or 250 users as fast as it can. These numbers can be changed while the test is in progress.

The optional Real Client component provides the opportunity to have real users running on separate machines testing the site from a user perspective.



Using the Monitor program, Webmasters create the test plan either by writing a script or via a point-and-click interface. The test executes user and system-defined timers for clients. The Monitor then communicates with the load server and the live client to get updates, keeping a log of when a request is sent, received, transmitted and completed. Access to the server is measured in transactions per second and in kilobytes per second throughput. This data is presented as reports or graphs and can be viewed in real time. The reports can also be stored to build up a history of the application's performance.

It is debatable how valuable this kind of information is for an Internet Web site. Very few sites will have 250 users constantly making requests. The nature of Internet usage is to make a request, read a bit, scroll for half a minute, then make the next request. In addition, a large part of a Web site's performance will always be out of the Webmaster's control, which can make the results somewhat misleading. A Web server can only deliver information as fast as the slowest link in the whole Internet delivery mechanism. Because Web servers try to evenly distribute processing between users, this causes a backlog as the server tries to pump information out but has to keep task switching between all the users. If the Web server has been tested to support 1,000 concurrent users over a 10Mbps LAN, it can issue the HTML very rapidly and move onto the next, due to the speed of the LAN. So, while a WebLoad benchmark may assure Webmasters that their server can put out the information fast enough to serve 1,000 users, this result can be quite spurious as the slower links can grind it to a halt.

A workaround would be to make use of the Real Client program with live clients dialling in over the Internet and checking those figures for a more realistic performance.

Given this qualification, WebLoad would be more appropriate for testing intranet sites rather than Internet sites.

WebLoad is available for Windows 95/NT and Solaris. The Monitor and Real Client stations require a TCP/IP-enabled PC running Windows 95 or Windows NT 3.51 or 4.0. RadView recommends use of a Pentium processor with 16M of RAM and 5M of free disk space. The Load Server requires a TCP/IP-enabled PC with a Pentium 133 MHz (or higher) microprocessor with 64M of RAM and 5M of free disk space running Windows 95 or Windows NT 3.51, or 4.0 or a Solaris 2.4 UNIX-based system with 64M of RAM, 128M swap file, Sparc 5 and up and 10M of free disk space.

Dominique Jackson

RadView WebLoad 1.3

Distributor	RadView (US)
Phone	Not available.
Online	http://www.radview.com/
Price	WebQualify on NT starts at $US795, on Solaris starts at $US1,000. Evaluation copies are available at http://www.radview.com/Download/index.html.
In short	While WebQualify will not give an iron-clad guarantee, it does indicate how many users a Web site can serve.

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If you thought the days of including an operating system on one floppy disk were over, then read on.

QNX Demo Disk 1.1

In these days of bloated OSes, disk-space-hungry Web browsers and applications that need masses of RAM to run, it is refreshing to see the introduction of tools designed to run on the most basic of systems.

The QNX demo provides a single floppy disk's worth of embedded applications designed to showcase QNX Software's Internet Appliance Kit.

The Internet Appliance Kit provides users with demos of applications (and code), the Voyager Internet Suite, development tools, the QNX OS, and the Photon microGUI.

The QNX demo packs in demonstration copies of a text editor; the QNX Realtime OS operating system, the Photon microGUI Windowing System, the Voyager HTML 3.2 Web browser (about 400K of code), a Voyager Embedded Web server (which fits in 14K of code), TCP/IP for QNX, a remote control which simulates a TV set top box, an Internet phone dialer, a file browser, and a vector graphics animation. But of course, being such small programs, there are obvious limits to what they can achieve.

QNX's programs are intended to be run on devices such as smart phones, set-top boxes, kiosks, printers, photocopiers and network computers. System requirements are meagre: a 386 or better, 6M of RAM, colour VGA video, a modem and a mouse. While a floppy disk drive is needed, a hard disk drive is not. All of the programs and data on the floppy are embedded using data compression technology provided by the QNX Embedded Kit.

To get the system to work with the graphics cards found in most computers, QNX created a 'flat' graphics driver technology, which writes into the frame buffer directly. The system switches most video cards to a 'flat' graphics mode, so that only one driver needs to be written. The performance was not comparable with what a traditional, specific driver would have afforded, but it was adequate.

It is a simple process to download the demo, unzip the files and copy them to a floppy disk, then reboot your machine with the floppy in the drive. But, because it is loaded from a floppy disk, the system takes quite a long time to start up — longer than Windows 95 — although it has a handy hardware detection feature, which will warn you if you have no modem connection, for example. Once in the program you choose the keyboard from the international selection (North America, France, Italy, Spain, Germany, Sweden, UK) and your preferred screen resolution (to a maximum of 1024 by 768 at 256 colours).

The OS has a Windows feel — you operate the applications via a Start-style QNX Workspace Menu that sits on the bottom left of the screen, and there is a clock on the bottom right. Our first test was to dial the Internet using the PPP dial-up connector, a simple process of typing in the ISP's DNS and phone number and choosing a means of access — we used a manual terminal screen. Unfortunately this information is not saved, so next time you use the application, you will need to re-enter it again.

Once online you use the Voyager Browser to access sites. It includes all of the basic features: Back, Forward, Reload, Hot List, and so on, and supports frames, animated GIFs and cookies, but not ActiveX or Java components. A compact and a full mode are available from QNX depending on the embedded system it will be running on.

System diagnostics and processor and Internet connection status information are provided in an HTML page, which is dynamically updated.

The QNX OS uses a microkernal and a group of optional modules which support POSIX. The Photon MicroGUI is a small-footprint, embeddable windowing system, with a microkernal surrounded by a team of cooperating processes — graphics manager, font manager, input manager, and so on. TCP/IP for QNX is the system used, with FLEET networking, to connect to the Internet.

The OS uses a different file system from the Windows system, so it can't read FAT 16 or FAT 32 files. You can't open a QNX Notepad file while using Microsoft Word in Windows 95, for example, or open an HTML file stored on your FAT 16 hard drive when in QNX.

The Notepad feature is basic, with four pull-down menus displayed across the top of the application: File, Search, Options and Type. The file commands available, for example, are new, open, save and exit.

The Remote control provided is nothing more than a gadget, serving no real purpose — you can power the machine by clicking on the power button and go forward and back, but if you have a mouse you can do these things anyway.

All in all, however, it is an interesting and enlightening look at what can be done using the QNX IAT for the still-developing NC market.

Selina Mitchell

QNX Demo Disk 1.1

Distributor	Computer Network Systems
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In short	An impressive showcase of the technology available to create lean programs and tools for thin clients.

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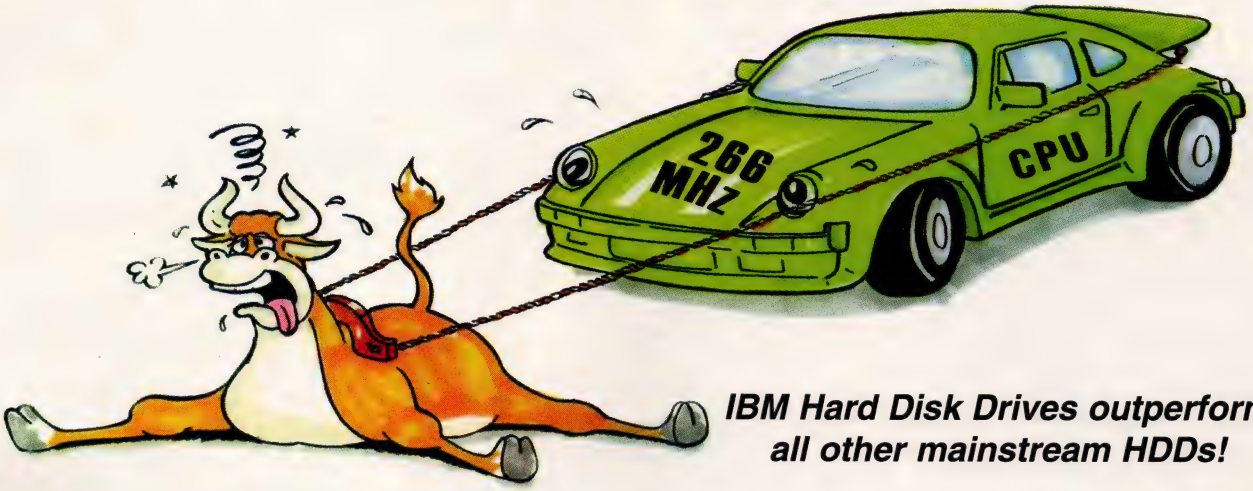

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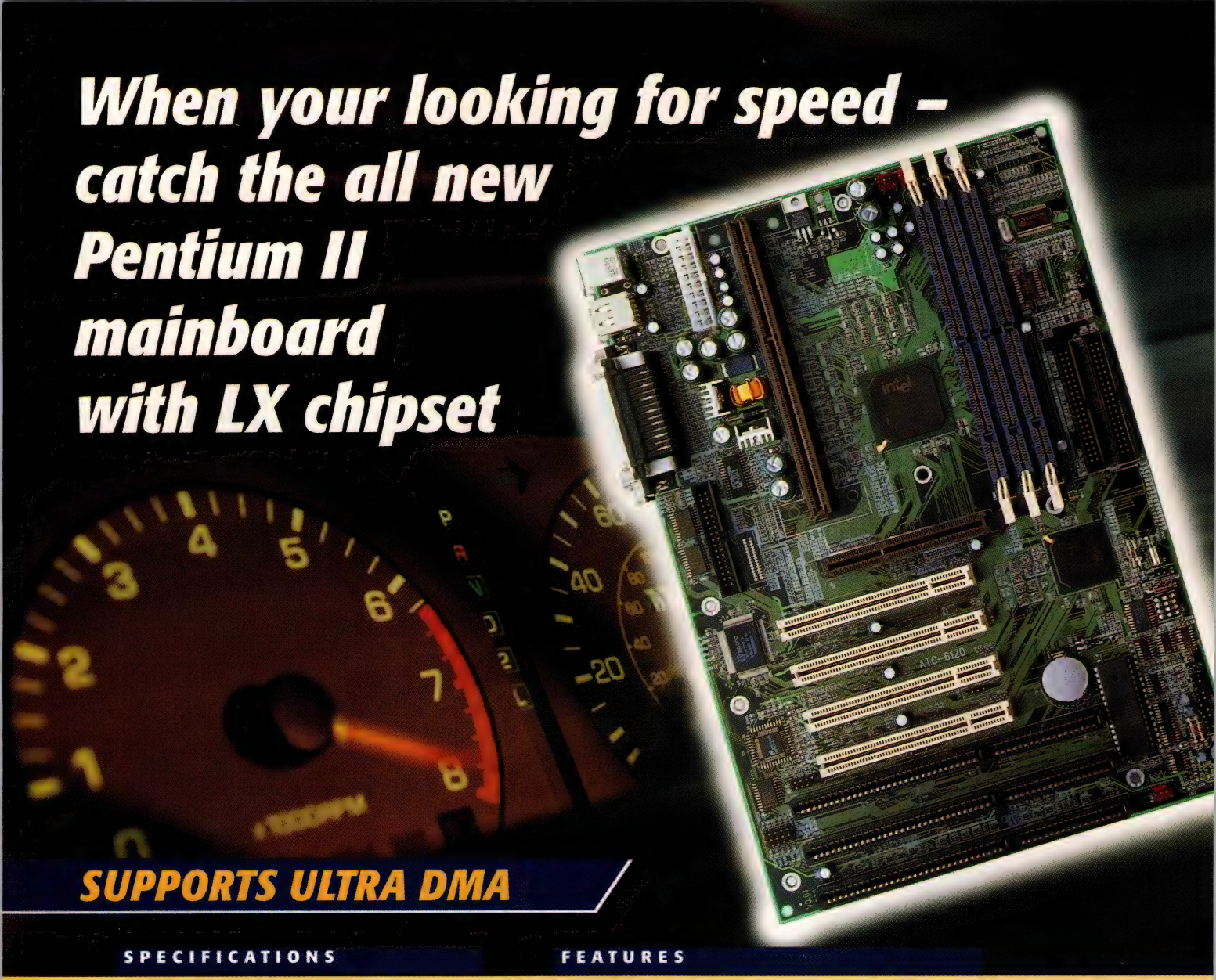

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Prohibition didn't work in the US. It didn't prevent alcohol, just drove it underground and limited both the production and supply to a number of people who just happened to be in the loop. And the booze, by all accounts, wasn't even very good.

By Helen Dancer

Introducing the *Net du jour*

Internet, intranet or extranet, call it what you will, the context changes, no matter what the subject, the minute someone wants to tell you what to say. The phrase *Net du jour* was coined, as far as I know, by Cisco Software's manager of security marketing, Roger Farnsworth, as a pertinent reminder of the fact that whatever we're calling it this week, the infrastructure remains the same. Whether the World Wide Webbed Internet, or the tamed, internalised intranet, or the extended, enterprise version, dubbed the extranet, it's the same conglomeration of hubs, routers, terminals, wires and people. What changes is the scope and spectrum of the content that's fostered within different cultural contexts, be they prescriptive, restrictive or completely open.

While people are at the extremities of the wires, they're at the nexus of the content-creation process. The notion of man in the machine implies that the unimpeded functioning of one is integral to the functioning of the other, and that the chain is only as strong as its weakest link. Do the infrastructure and content depend on each other, or are the two intertwined but discrete?

We are all by now overly familiar with the controversy surrounding the various prescriptive measures in the Communications Decency Act (CDA) which was overturned in June by the US Supreme Court as being unconstitutional, thanks largely to robust freedom-of-speech provisions written into the US Constitution. We've also been inundated with the various agendas of people on both sides of the same debate currently raging in Australia. But will the same constitutional robustness and vision save us from similarly curtailing our own Internet culture, or will we end up in the Internet community as one of a number of bonsais rather than one of the spreading oaks?

On a visit to Australia a year ago to present at Internet World, Singapore's foreign minister declared that his country did not have a monopoly ISP situation. Rather, he said, it had three, which was more than enough to offer real choice. It's more than enough, say Internet Association spokespeople, to put fear and loathing into the hearts of those who understand the medium and its potential.

Legislating within a geography, for a medium that is intrinsically transnational, is blitheringly pointless.

In this issue of *APC* my colleague Bruce McCabe offers his own views on China and Hong Kong, and the prospects for merging a closed infrastructure with a rampantly open one. At the time of going to press, this topic was evidently on many people's minds. Farnsworth also cited China as an example. There's absolutely no need to have a culture of thriving content in order to have a thriving infrastructure, he opined, and there's no question that it's possible to have a successful Internet society with regulation. It's entirely possible to have a viable service offering and a viable network construction without even taking content into consideration. But, like most of us, Farnsworth is quick to point out that as an adult human being he has trouble dealing with the notion that other people need to decide what it is he should see.

The 'human' element is the key, in my estimation, and has much more to do with scope than the amount of 'adult' material available in any Internet society. In much the same way as a car engine's quality is not judged merely by how fast it can go, but the way it performs between 0 and 180kms per hour, so the content we create as an Internet society will depend on how far we can stretch, and where we perceive our limitations to be. It's about text and subtext, and pushing the boundaries of conventional thinking, even if those ideas don't include naked bodies and physiologically improbable acts with farmyard animals.

I think most of us have given up expecting the government (I speak generically, since one proved to be all rhetoric and no action, while the other seems intent on a process of legislation without consultation) to understand what we want in most facets of our lives and respond to those needs and fears. But legislating within a geography, for a medium that is intrinsically transnational, is blitheringly pointless. And in such an inhibited environment, the product that we end up projecting to the outside world is a whole that is somewhat less than the sum of all its parts, and far less a reflection of our true ability to create and to contribute. It's a toughie. In the face of public concern, the government (wherever it is) necessarily needs to look as if it's making a stand, but the potential to look foolish, Farnsworth reminded me, is there no matter what you do.

Early on in the life of this column I referred to a John Fowles novel in which he writes that in order to teach a boy to sail it's necessary to show him how to tie the ropes and man the sails, but then it's detrimental to his understanding of the process of sailing to fix the ropes so that he can only ever sail in one direction. It bears repeating as we sail into the wind on the issue of legislating what the Internet in Australia will look like.

HTML in the standards zone

We need strong HTML standards for the World Wide Web. But all has not been well in HTML land over the past 12 months. Now that looks set to change.

By Jeremy Horey

You may have heard about dynamic HTML but I am sure that, apart from the demos linked from the Microsoft and Netscape sites, you won't have seen any, because nobody is using it. Dynamic HTML could be a great tool in building a more interesting Web, but Microsoft and Netscape have come up with different forms of it. What works in Version 4 of one browser will not work in Version 4 of the other browser. Until there is a single package, it is dead. Nobody with any sense is going to go through the pain of developing a Web site in Dynamic HTML only to find that a significant part of the Internet-using public can't see the site at all.

In the days when Netscape had 80% or 90% of the market you could get away with building a Netscape-only site. But as Internet Explorer has gained market share — or eyeball share, as some call it — it has become impossible to ignore. If you are developing a Web site you can't turn your back on nearly a third of all Internet users. Netscape Navigator 3 and Internet Explorer 3 are just not 100% compatible. There are plenty of quirks that make it hard to deliver the same impact in a Web site on both browsers.

There is a rule of thumb here that is useful and also illustrates the differences between the versions. If you are designing Web pages, get the HTML working in Navigator 3 first and it will look good on Explorer 3. But do the scripting on Explorer 3 first and it will then work in Navigator 3.

Explorer 4 is not yet final, but the new versions of the two leading Web browsers look like diverging further. This is very bad for the Web. It makes it harder than ever for people to put together interesting and useful Web sites. It also means that things stagnate. No-one is game to use the new features in the browsers because they are not compatible. What makes a site look great in one browser can ruin the site for the other browser.

But now the World Wide Web Consortium (W3C) has published its draft specification for HTML 4.0. Although it is still a draft, the specification looks to have the support of both Microsoft and Netscape. It seems that the browser makers have started to listen to the great clamour of complaint that is audible across the Web whenever browsers are discussed.

Explorer 4 is not yet final, but the new versions of the two leading Web browsers look like diverging further. This is very bad for the Web.

Modern Web sites are complex pieces of software and design. Dealing with incompatible browsers adds to the complexity but doesn't add to the function or interest of the site.

The new HTML 4 offers lots of features that designers can use to extend the functionality of the Web. Version 4 improves the major structural elements of HTML: forms, tables and frames. It also allows better integration between HTML and programming and scripting languages. And, just as importantly, it makes adaptations in HTML that allow it to display other languages and other scripts just as well as English.

It seems that at last both Netscape and Microsoft have realised that the Internet is different. Developing software to use the Internet is not the same as developing a new word processor or even the same as developing a new Web server. (Web-site developers are much more forgiving of incompatibilities in Web servers. There are very major differences between different Web servers and these differences seem to be growing.) You can do what you like inside a word processor, providing you allow people to easily move documents into and out of its particular format. This is not the case with Web browsers — Web browsers need to respond the same way to the same HTML. The software developers have to please the people who build the Web sites, because the viewing or browsing public will blame the site rather than the browser if something doesn't look right.

It will take some time for companies to fully implement HTML 4, but the change seems certain. Let us hope that they will also get together and fix some of the other incompatibilities between the two browsers.

Jeremy Horey is available on email at jhorey@ozemail.com.au.

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Resisting the push

It's the latest and greatest. It's push technology, and it promises to save us loads of time and connect fees. It will search the Web for us and customise our Internet contact so we see just what we want. Brilliant.

By Jeremy Torr

Call me a cynical old git if you will, but it won't be what we want at all. It will be what some programmer who links expert rules together thinks we want. It will be a synthesised version of freedom of choice. It worries me more than a thousand Mr Pervies putting up pathetic attempts to shock kiddies on some newsgroup.

The reason it worries me is twofold. First, the Net is so new, so fresh and, to most users, so exciting and believable. To the new user, that makes the Net right. Read something in the paper and you will temper the message with the knowledge that the journalist reports to the editor, who reports to the publisher, who will have a political direction. The difference between Melbourne's *Herald Sun* and *The Age* in editorial terms is obvious. You know that you can read between the lines.

Not so the Internet. What you find there will be textual and pictorial data that may be correct. It may also be hideously incorrect, libellous, distorted, mischievous or just plain wrong. You have no way of telling, no means of redress if it is, and no excuse if you take it as gospel. Yet I'm astounded at the number of people I have spoken to who tell me a fact is obviously, incontrovertibly true because they saw it on the Net.

The second thing that concerns me about the Net is that it has everybody on there with as much to say as they want about anything they want. New Zionists to fascist anti-Holocausters, radical lefties to cauliflower-rights advocates. All are there, all have equal access and accessibility, all can be selected by any user should they desire to check them out. This freedom of information — admittedly only available to those wealthy and politically free enough to have Net access — is what makes the Net such an explosive phenomenon. It can be likened to the Reformation in Europe, when ordinary people first got to see books and realise that they could learn about things previously hidden from them. They explored everything from witches to beer-making with a zeal that had been repressed for millennia.

Combine this thirst for knowledge with the perceived veracity that the computer screen gives information displayed on it, and you have a potentially dangerous situation. Especially if some smart programmer at the Push Technology Institute decides that fascists are morally indefensible and doesn't include them in the potential site index, or if the push technology search engine is skewed to favour all the sites and reports relating to one particular industrial corporation.

It worries me more than a thousand Mr Pervies putting up pathetic attempts to shock kiddies on some newsgroup.

Don't think I'm being paranoid. These things have already happened. In the US, the director of one 'children's Net protection' service refused to give a list of banned sites, and threatened to sue anyone who asked — presumably because the filters excluded such areas as gay rights and left-wing zones. Microsoft has used unauthorised links on some of its Web pages, presumably in order to hook otherwise uninterested browsers. Next, sites that are popular because of their content may be squeezed out by push engines that give the user a very limited set of content choices, based on who has paid the most.

This is dangerous territory. The Net is still growing, and it is still accessible by anyone who has an axe to grind or a theory to expound. But if push technology becomes the main vehicle by which the majority of users gain access, we shall be throwing away the right to both access and evaluate the information that we choose.

Admittedly, you can always switch off. But doesn't that seem rather a shame when the potential of the Internet is as enormous as it is? By building push technology into operating systems, the marketing gurus will undoubtedly stifle the creativity and openness of the Internet and replace it with merely another avenue for advertisements and public-relations treatises that will become sufficiently self-serving and slick that the users who made the Net grow will back off and find alternative ways to promote their dreams.

We should remember that the original idea behind the computer was to help produce mathematical answers more quickly. The personal computer is best used as a tool, not as a vehicle to solutions or as an escape for those that don't want to think for themselves.

Bill Gates has announced a $US200 million fund to port Internet access into libraries in 'disadvantaged areas'. Given the hype push technology is getting from the Gates camp, I would seriously question the motives involved there.■

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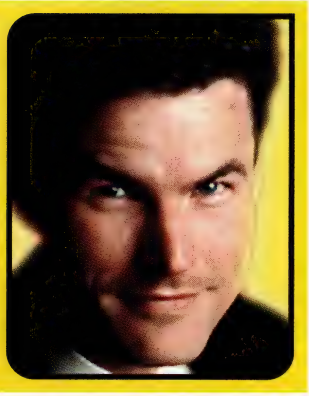

One nation, two systems, no chance!

Print, radio and TV media were saturated with stories on the Hong Kong handback in the first weeks of July, each with its own hypothesis for the future. Having spent the early 1980s living and travelling in Asia, including eastern China, I have a few opinions of my own.

By Bruce McCabe

In the technology world, there is no denying that China has become one of the most exciting opportunities ever. Back in 1981 it was just beginning to open up to international trade, and Australian companies were among the first to make tentative forays into this new market. I remember being amazed to see a product of one of these early deals on a street in Shanghai: a Holden Kingswood! It stood out a mile from the locally produced cars which, at the time, were all large and black and looked as if they had been designed in the 1950s.

Although economic development was about the furthest thing from my mind, I saw plenty of other indications of just how much potential China had as a market for technology. It was evident that the average person had practically no access to any of the devices we took for granted. The most striking example of this was when a guide related how close she was to buying an electric fan. She had been saving up for some time and it represented a substantial purchase for her. Once she bought it, however, she still had to build it — the fan came as a kit. Another indication was the crowd that gathered around the display window of a shop selling television sets.

Sixteen years on, the equation seems obvious: if you take 1.2 billion people, improve their average earnings, lower trade barriers, relax high-technology embargoes and combine all this with falling technology prices, you get the biggest and most dynamic market opportunity in the world.

China as a sales opportunity has, temporarily, taken a back seat. Hong Kong has brought China as an influence on the future of Asia sharply back into focus. What will happen — socially, politically and economically — in Hong Kong? How far, and how fast, will China go in making changes? The optimists point out that the world is watching China carefully and, if it should move too quickly or too carelessly with Hong Kong, world opinion will be soured. This could, in turn, bring about grave consequences in trade relations for China, denying it access to, among other things, technology. China will step carefully, they say, because it has too much to lose.

But the premise that world opinion is enough to sway Chinese policy is flawed. For one country to listen to another it must first respect the platform upon which the speaker stands. The Chinese are proud of their country and their national achievements. Whatever the shortcomings, it would be a mistake to think that they do not have confidence in their system and in the direction they are taking as a nation. They do not harbour any feelings of inferiority in the face of either thriving Western economies or stern rhetoric from Western leaders. One of the more ridiculous episodes I have witnessed was Alexander Downer making his speech in Hong Kong with stern words of how Australia will be closely watching Chinese behaviour post-hand-back. How much do Americans worry about our views on US domestic policy? Do we really think the Chinese would care about what we think of theirs?

The idea that trade can really be used as a weapon against China is also flawed. China certainly values trade access, but who needs whom the most? Western governments can be pressured by public opinion to take trade action over events like the massacre in Tiananmen Square, but counter this with the enormous weight of pressure brought to bear by industries that stand to make billions of dollars in exports and there is no contest. How many Tiananmen-induced trade sanctions still exist today? Trade sanctions make people feel good about themselves for a while. Exports mean better employment figures and a healthier balance of trade. At election time voters tend to have short memories.

How many Tiananmen-induced trade sanctions still exist today?

Regardless of what happens in Hong Kong, China will have considerably greater impact in Asia in years to come, especially as its economic power grows. Perhaps the most interesting developments will centre on Taiwan. Immediately after the hand-back Li Peng, China's prime minister, made a speech directed at Taiwan which reiterated his country's long-standing offer of reunification on the same terms as Hong Kong ('one nation, two systems'), but the Taiwanese are fiercely independent and any moves in this direction are potentially disastrous. In this example, particularly, the implications for the world's high-technology industry, given Taiwan's pivotal role in the production of computer components, are more significant than any to be found in Hong Kong.

Bruce McCabe is senior industry analyst with Gartner Group/Dataquest.

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Beam me up

You either love Manhattan or hate it. I love it. If only Scotty would beam me up, then down. Sydney — zzzzzzzzzip — Paramount Hotel. Unfortunately, the world doesn't work that way.

By Julian Ehrlich

Prerequisites of a real Manhattan trip are a series of Sydney airport queues, a sealed metal tube, torture by Hollywood movies with food *(sic)* to match. Then joy in US Immigration, luggage queues, customs, bus queues, waiting, another metal tube, six hours of Hollywood movies and American snack food, more luggage, transfers. At last, heaven on a stick — the Paramount Hotel. All up, 25 to 30 hours.

Economists and technologists frequently make such trips. From the Chicago School of Economics or Silicon Valley, gurus have flown all over the world spreading the gospel. Although they encounter the same tubes, queues, movies, food (*sic*), transfers and turbulence along the way, the gurus still don't notice that Scotty has not beamed them from where they are to where they want to be. They must travel every last godforsaken centimetre themselves.

To be fair, it's a far, far better trip that I have made today than I have ever made before! Jet travel is a lot better than 16th century galleon. But whether you walk, ride, sail, or fly, each centimetre is yours to travel. No-one can do it for you. When needed most, Scotty is nowhere to be found.

Yet the often punishing physical experience of travel makes no impression on the minds of economists or technophiles. Perhaps this is the effect of the combination of exhaustion, Hollywood movies and food (*sic*). But if their travels had not passed in a blur maybe these economists and IT gurus would notice that no-one can get zzzzzzzzzipped by Scotty, in space or in time. Maybe they would reflect that the only way to get from feudalism to happy@future.com is to pass through each painful, bloody, polluted, vile intermediate stage.

Economic theory cannot help you make the transition from serf to HTML programmer. 'Deploying Technologies' does not simultaneously crossgrade human operating systems from Feudal 1.0 to Post_Industrial 3.2 or higher. Each socio-political environment requires its own platform and mandates its own communications, data storage, and data access solutions. Further, you can't just upgrade in quick succession from Feudal 1.0 to Feudal 2.0 without also going through each intermediate upgrade of 1.1, 1.2, 1.2.1, 1.5, and 1.7.2 . . . Then there's the crossgrade to Mercantilism 1.0 — but that requires new legal infrastructure and a replacement of management from Nobility x.x to Bourgeoisie 1.0 or higher. In every single case, always, this change of management involves not direction of a board or completion of a purchasing requisition, but a civil war, sometimes several. And it's invariably ugly.

The difficulty is that the computer chip is not simply the physical product of a factory. It is a product of a spectacularly complex interplay of legal system, music, weather, street crime, fonts, political history, geographic location, and literally innumerable other factors and interactions upon interactions. The Internet is the product of even more arcane and esoteric processes and factors.

A developing society can join the high-tech age only by widely deploying advanced social, economic, legal, cultural, emotional, human, 'in-the-head' software. But deploying that 'software' means that the society is already developed. Catch 22. Or an 'alien technology' can be grafted. Such grafting has been attempted before: it was called colonialism.

Will Colonialism 2.0 work better? Well, we're dealing with a raft of countries that, in spite of confronting a deadly disease, typically can't manage to say the word 'condom' in public. Thailand is, of course, the premier exception, where the anti-HIV program is truly heroic. The rest — all of them — are varying shades of loser.

Homeorhesis, following every centimetre of the same path, seems to be the only way, with only two known large-scale attempts to the contrary — the Soviet Union and Japan. Both countries were feudal dumps in the mid-19th century. Both industrialised themselves via the standard grisly Western road of dictatorship and expansionism. Both failed and were devastated. Japan's post-war rise is due to massive Western investment and preferential trading treatment as the eastern bulwark against international communism. Who is offering massive, no-frills, no-strings investment for Africa? Asia? South America? Oceania? Or that leaky tub Australia?

Who is offering massive, no-frills, no-strings investment for Africa? Asia? South America? Oceania? Or that leaky tub Australia?

Maybe developing countries can leap from economic and technical relative backwardness to happy@future.com. But in the absence of Scotty, I don't think the world works that way.

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Cybertot advertising

It's a marketing tool being employed by a growing number of organisations hoping to capture the online loyalty and spending power of children. Web advertising sites become entertainment centres and kids-only clubs in an attempt to lure this cash-poor but influence-rich market niche.

By Cathie Kennedy

Several sectors of the community have suggested that many interactive advertising and marketing techniques threaten to manipulate children. A report by the Center for Media Education (CME) in the US, for example, talks of "disturbing new practices; the exploitation of vulnerable, young computer users; unfair and deceptive forms of advertising; and violating long-standing safeguards protecting children". This growing concern seems to be based on a blurring of the distinction between ads and content or, to use the buzz word, the increase of 'infomercialisation'. The Colgate Palmolive Web site, for example, invites children to Dr Rabbit's No Cavities Clubhouse, where, among many other activities, there is a story with a colouring-in book. Of course, the story is all about oral hygiene.

But Colgate's approach is not unique to online marketing. A four-year-old recently asked me to read a story, and came running out with his favourite book — a catalogue from a large toy store. Now that's not as ludicrous as it sounds. The designers of this catalogue had built fantasies and stories around the products to encourage children to escape into the mystical, magical toy world. Guess which toy shop this four-year-old always wants to visit when he goes out shopping?

The CME report correctly suggests that marketers are able to compile individual profiles on children by encouraging them to fill out online surveys about themselves in exchange for free gifts or the chance to win great prizes. This, the report suggests, is an invasion of children's privacy used purely to target individual children. In cyberspace, the Nabisco Neighbourhood asks children to fill in their contact details for the chance to win a "cool, colourful Nabisco Thing bendable toy".

The report's concerns are relevant, but do the methods used by online marketers really differ from conventional marketing? I recall my own childhood, responding to endless surveys gathered from the local supermarket. These were disguised as a chance to win a new bike, a trip to Disneyland or one of hundreds of consolation prizes. I would obligingly fill in my name, address, contact details, age, number of siblings, favourite food, favourite drink, whatever the form asked, and lodge it in the entry box during our next weekly shop. My mother could never work out how I came to be on so many mailing lists.

CME also suggests many online advertisements are unfair and deceptive, pointing to the entire electronic advertising environments that have been built to entice children to spend hours playing with product 'spokes-characters' such as Kellogg's Snap, Crackle and Pop.

Am I the only person who has purchased a packet of cereal that houses one in a series of plastic toys? Isn't the same ploy at work here? Children will start playing with these characters, and urge their parents to keep buying that brand so they can complete the set.

Take a recent example. Frito-Lay's Thins chips currently include a Magic Motion Tazo disk — a special Star Wars Trilogy edition — in every pack. It is a round piece of cardboard, a little larger than a 50-cent piece, with the Tazo logo on one side and a Star Wars character on the other. There are 80 to collect in all. I know, because when I went to buy a packet of chips for my four-year-old friend, he gave me strict instructions to make sure I purchased the Star Wars packet. He had no idea of the brand — he just wanted to collect another disk. This is taking the concept of spokes-characters a step further, using existing popular characters to promote your product. McDonald's is a prime example.

What's the difference between traditional marketing and cyberspace marketing for children? Same audience, same marketing ploy, same objective — just a different medium.

Finally, before we become too passionate about cybertot advertising, we need to ask how many children are truly exposed to these new techniques. Given that most people with a home PC are paying for their Internet access, I doubt that many children are allowed to sit for hours each day surfing as freely as they wish.

And those of you who access the Web using a 28.8Kbps modem and Pentium PC will agree that it's not exactly lightning speed, especially when you're accessing graphically-intensive pages such as the children's sites where animated characters are found. Certainly not fast enough to keep children returning time after time. All the children I know would prefer to explore the latest CD-ROM, play with their dolls or kick a football.

So is 'cybertot advertising' a potential threat to children? Is it deceptive, unfair and manipulative? Well, perhaps yes, but I suggest that it's no more so than any other form of advertising and marketing we've witnessed over the past 30 years.■

What's the difference between traditional marketing and cyberspace marketing for children?

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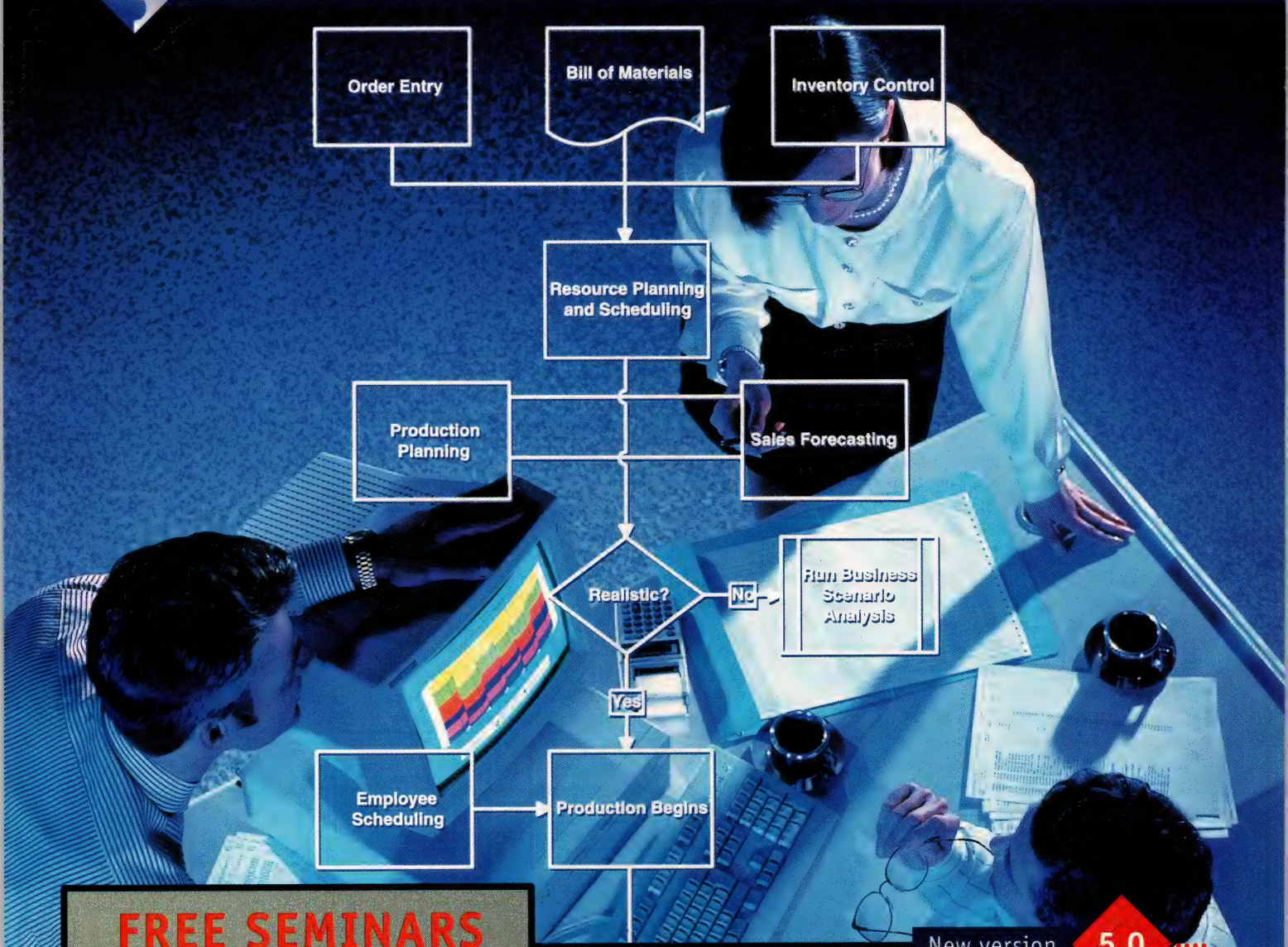

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Double dealing

I am writing in regard to the recent hype surrounding Microsoft's Zero Administration for Windows (ZAW) software, which is soon to be released, and in response to Angus Kidman's 'Cost of Ownership' article [*APC* June 97, page 98], which covers a small facet of this supposed 'new' technology. I have been working for a large Australian international corporation for the last eight months, and I fail to recognise the need to introduce a 'new' software system into the already confusing world of the IT infrastructure within a large corporation. I am sure many others feel the same.

In an IT environment which is still running Windows for Workgroups, or which has mistakenly taken the upgrade path to Windows 95, the ZAW proposal from Microsoft seems a worthy investment. From preliminary total cost of ownership (TCO) estimates, mentioned by Angus, this seems to be the wiser path, but the fact remains that a percentage of corporations with an installed base of more than 100 PCs have already committed themselves to the Windows NT operating system, which currently incorporates a great many of the supposed new features to be found in ZAW.

In the current version of NT 4.0 Server and Workstation, the Policy Editor (POLEDIT.EXE) and Profile Manager tools (although hidden to some extent) can be easily adopted into the existing NT 4.0 installed PC base, without [the user] purchasing further software and bearing the cost of an entire infrastructure overhaul. (These tools are accessible as part of the Server Tools found on the NT 4.0 Server CD-ROM.) Once again the IT industry finds itself pushing the cost of an unneeded fancy new interface (ZAW) onto the consumer, who in turn passes the cost to the general public via increased pricing of already overpriced services.

Brad Watson
Internet

Why software sucks

I would like to congratulate Angus Kidman for his piece entitled 'Why software sucks' [*APC* July 97, page 84]. In a magazine which is often guilty of promoting the latest updates to the bloatware which is choking our systems, it is refreshing to read a more realistic view of the situation.

As a computer technician turned farmer, I provide unofficial support to a number of people in the district. The most common question asked is 'Why doesn't this work?' Quite often it will be a trivial thing (for example, the screen saver sometimes doesn't kick in) where it can only be put down to some obscure Win 95 bug. Sometimes it will be more severe (the printer was working fine yesterday but it's not today) where you can spend hours fiddling and resolve the problem without really knowing why; or you come up with a cumbersome workaround which leaves you feeling frustrated and dissatisfied.

When it's an easy fix you walk away feeling pretty smug, but when you can't resolve the problem because the bug is so severe, you feel that you've let [the person] down in some way. I do this for free, but I can imagine consultants who charge by the hour would have great difficulty justifying their bills under such conditions.

How do we change this situation? How many people have been sucked in to buying a piece of software after reading the glossy promotional material only to find that it didn't live up to their expectations? A factor often overlooked is how many of these people, with nobody to turn to for advice, assume that the problem is with their lack of computer skills? In this instance, they will accept shoddy products because they know no better. Worse, their self-confidence when learning to use a PC will diminish further as the bugs reinforce their view that they are somehow at fault. All of this due to their faith that the product must work as advertised, otherwise the company wouldn't be able to sell it!

Articles such as this convince me that my subscription to *APC* is well justified.

Phil Moore
'Kitchener' via Wagga Wagga

Ed note: What do you think? Do you get what you pay for with software? We invite you to join our discussion on 'Why software sucks' at http://apcmag.com/forum/.

More software bugs

I read with interest Angus Kidman's article 'Why software sucks'. Of particular interest was the sidebar 'Ethics? What ethics?' where Jim Macnamara, chairman of the BSAA, said "There have been some cases of bugs in original software."

This comment got a colleague and I thinking, what original software could we think of that did not have known bugs? After much thought we came up with one, every new programmer's favourite; the 'Hello, world' program. How wrong we were: it seems even that has bugs, at least Michael Smith's version does [*APC* July, page 153]. In fact, his version won't even compile! The first line of his code will cause a declaration syntax error. It should have read #include <stdio.h>.

Apart from a few small bugs :) keep up the great work!

Graham Green
Internet

Ed note: Oops. You're absolutely right, the first line should read #include (as any C user would instantly pick up).

Corrections

Digital

APC acknowledges that there is no relationship between Digital Research and Digital Equipment Corporation (DEC), as was implied in the story 'Chips at 30 paces' on page 29 of our July issue.

ISYS: Web

In *APC* July, we were not aware that existing users of ISYS: Web (see page 40) would receive the upgrade for free.

Clustering

It was not indicated in the article that further information to 'Clustering takes off' (*APC* August, page 110) is available on APC's Web site, http://apcmag.com.

Sharp notebook

In last month's Notebook comparison (*APC* August, page 135), the maximum internal resolution of the Sharp PC 9800T was incorrectly given as 800 by 600. The correct resolution is 1,024 by 768.

Optik Surfer

In 'The Search for Optik Surfer' (August *APC*, page 88) it was not stated that the child pornography possession charges against Skeeve Stevens were dropped.

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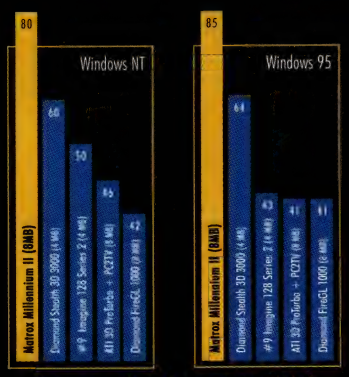

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Award Winning Performance

Dell wins Editor's Choice!

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PC Magazine online, June 10, 1997

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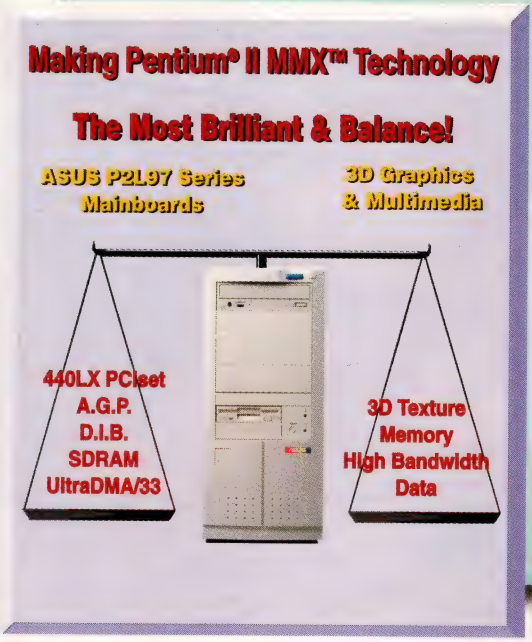
* All performance tests conducted by Matrox Graphics Inc. Windows NT 4.0 tests conducted on a Dell Pentium Pro 200 Mhz with 32 MB of EDODRAM and 256K cache. Matrox Millennium II, Diamond Stealth 3D 3000, Number Nine Imagine 128 series 2, ATI 3D ProTurbo+PC2TV and Diamond FireGL 1000 tested using driver releases 3.06, 2.03, 4.102.21, 3.1.75 and 2.70.4.0.27 respectively. Windows 95 testing was done on a Gateway 200 MHz MMX with 32 MB of RAM and 512K cache using driver release 3.41, 4.03.00.3105, 2.13, 3.03 and 4.03.00.2101.0008 respectively. All boards tested were configured with maximum memory configurations. Winbench 97 business tests conducted at 1024 x 768 @24-bit at 75 Hz using small fonts under Windows NT 4.0. and 95.

The Latest Intel 440LX PCIset Pentium® II Mainboard From ASUS

A.G.P. Accelerated Graphics Port

ASUS 440LX Mainboard Delivers



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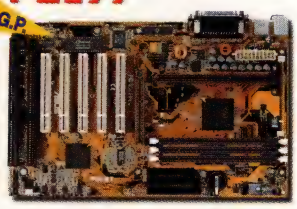
P2L97

A.G.P.



- **CPU:** Intel Pentium® II MMX™ CPUs 233MHz - 333MHz
- **Chipset:** Intel 440LX PCIset
- **Memory:** 3 x DIMM for 3.3V SDRAM, Total 8MB - 384MB, ECC Supported
- **Slots:** 1 x AGP Slot, 5 x PCI Slots, 2 x ISA Slots
- **AGP Port:** AGP 66MHz/133MHz (Sideband) 3.3V Device
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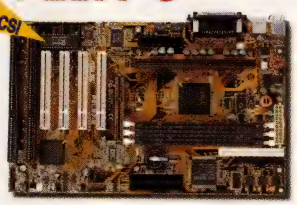
- **I/O Ports:** 2 x USB Ports, 1 x PS/2 KeyBoard Port, 1 x PS/2 Mouse Port, 1 x Parallel Port, 2 x COM Ports
- **H/W Monitoring:** Optional LM78 for System Temperature, Fan Status and Voltage Status with LDCM Client & Administrator Software
- **Board Size:** 21.2cm x 30.5cm or 8.3"x 12"

P2L97-S

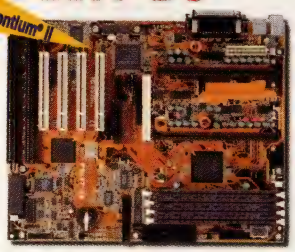
UltraSCSI



- **CPU:** Intel Pentium® II MMX™ CPUs 233MHz - 333MHz
- **Chipset:** Intel 440LX PCIset
- **Memory:** 3 x DIMM for 3.3V SDRAM, Total 8MB - 384MB, ECC Supported
- **Slots:** 1 x AGP Slot, 4 x PCI Slots, 2 x ISA Slots
- **AGP Port:** AGP 66MHz/133MHz (Sideband) 3.3V Device
- **IDE:** 2 x UltraDMA/33 IDE Ports Support ATAPI IDE CD-ROM & HD Greater Than 8.4GB
- **I/O Ports:** 2 x USB Ports, 1 x PS/2 KeyBoard Port, 1 x PS/2 Mouse Port, 1 x Parallel Port, 2 x COM Ports
- **H/W Monitoring:** Optional LM78 for System Temperature, Fan Status and Voltage Status with LDCM Client & Administrator Software
- **UltraSCSI:** Adaptec AIC7880 UltraSCSI Fast/Wide Controller
- **Board Size:** 21.2cm x 30.5cm or 8.3"x 12"

P2L97-DS

Dual Pentium® II



- **CPU:** Dual Intel Pentium® II MMX™ CPUs 233MHz - 333MHz
- **Chipset:** Intel 440LX PCIset
- **Memory:** 4 x DIMM for 3.3V SDRAM, Total 8MB - 512MB, ECC Supported
- **Slots:** 1 x AGP Slot, 4 x PCI Slots, 2 x ISA Slots
- **AGP Port:** AGP 66MHz/133MHz (Sideband) 3.3V Device
- **IDE:** 2 x UltraDMA/33 IDE Ports Support ATAPI IDE CD-ROM & HD Greater Than 8.4GB
- **I/O Ports:** 2 x USB Ports, 1 x PS/2 KeyBoard Port, 1 x PS/2 Mouse Port, 1 x Parallel Port, 2 x COM Ports
- **H/W Monitoring:** Optional LM78 for System Temperature, Fan Status and Voltage Status with LDCM Client & Administrator Software
- **UltraSCSI:** Adaptec AIC7880 UltraSCSI Fast/Wide Controller
- **Board Size:** 24.4cm x 30.5cm or 9.6"x 12"

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In the year since we last investigated configuration and pricing for a SOHO PC, the standard processing power and storage have more than doubled.

Entry-level SOHO PCs

In August 1996, we reported that the entry-level SOHO PC was a Pentium 100MHz with 16M of RAM, a 1.2G hard disk and a 6x CD-ROM, with an average price of $2,300. This month, dealers were recommending a Pentium 200MHz, 32M of RAM, 3.2G hard disk and a 16x CD-ROM. Fifteen-inch monitors are entrenched as standard, with some dealers offering an upgrade to an entry-level 17in monitor for around $300. Included also in the specification are a mouse, keyboard and speakers.

Of the nine companies contacted, only two — Melbourne-based Business Works and Gateway 2000 — suggested an MMX processor, which is designed to enrich multimedia and communications. *APC* benchmarks (see *APC* April, page 121) indicate that an MMX Pentium outperforms the classic Pentium by around 20% to 30% using office-automation applications, and higher when running MMX applications such as games and edutainment software. However, with Microsoft not planning to enable Office for MMX, it is unlikely to be adopted as a standard office or corporate platform.

The price of storage is astoundingly low these days. A 2.1G hard disk sells for around $290, and a 3.2G for an additional $100. The representative from Brisbane-based Queensland Computers offered an upgrade from a 3.5G to 4.3G hard disk for just $40, and Gateway 2000 advertised an upgrade from a 1.6G to 6.4G hard disk for $249. All PCs came standard with Windows 95, while some also included a range of programs including Microsoft Office, Works and Home Pack, Webster's Educational Bundle, a six-pack games pack and Lotus SmartSuite.

It seems more dealers are offering the option of upgrading to an onsite warranty. Queensland Computers provides an upgrade to three years onsite for $80, and Sydney-based Distinct Computer Solutions is offering two years for $120. It is worth considering, as packing up your PC and returning it to the place of purchase can be a hassle, particularly if you work from home. You also suffer the inconvenience of being without your PC

Continued on page 68

SOHO PCs

Company	Phone	Configuration	Price	Warranty	Bundled software
Business Works	(03) 9819 6693	Pentium 200 MMX 3.2G HD, 16x CD-ROM, 15in monitor	$3,400	3 years parts and labour; first 90 days onsite	Windows 95
Computech	(03) 9532 7958	Pentium 200, 3.2G HD, 32M RAM, 16x CD, 15in monitor	$2,040	2 years parts and labour	Windows 95
Distinct Computer Solutions	(02) 9948 8799	Pentium 200, 3.5G HD, 32M RAM, 16x CD, 15in monitor	$2,499	3 years parts and 5 years labour; 2 years onsite an additional $120	Windows 95, Microsoft Money, Works, Encarta and Golf
Gateway 2000	1800 068 918	Pentium 200 MMX, 16x CD, 3.2G HD, 32M RAM, 15in monitor	$3,547	3 years parts and labour; first year onsite	Windows 95, Office 97, plus a choice of one of three CDs
Mirage Electronics	(02) 9743 8277	Pentium 200, 3.2G HD, 32M RAM, 16x CD, 15in monitor	$2,280 ($2,640 with MMX processor)	2 years parts and labour	Microsoft Home Pack*
PC Australia	(03) 9428 0455	Pentium 200, 3.2G HD, 32M RAM, 16x CD, 15in monitor	$2,080	3 years parts and 5 years labour Lotus SmartSuite	Windows 95
Queensland Computers	(07) 5528 9937	IBM P200+, 3.5G HD, 32M RAM, 18x CD, 15in monitor	$1,510	1 year; 3 years onsite an additional $80	Windows 95
South Pacific Computers	(03) 9764 2222	Pentium 200, 3.2G HD, 32M RAM, 16x CD, 15in monitor	$2,645	3 years parts and labour onsite	Windows 95, Microsoft Encarta, Cinemania, Golf and 3D Movie Maker, Lotus SmartSuite
Surry Hills PC	(02) 9699 4598	Pentium Pro 200, 2.1G HD, 32M RAM, 12x CD, 15in monitor	$1,820	2 years parts and 7 years labour	Windows 95, Microsoft Home Pack*

*Microsoft Home Pack includes Money, Works, Encarta, 3D Movie Maker and Cinemania

You've taken the time to write a complaint letter, but the vendor disputes your version of the story. How will your problem ever be resolved? **By Roulla Yiacoumi**

Your word against theirs

When it comes to resolving a problem you have had with any purchased goods or services, the vendor in question should be your first port of call. But what do you do when the vendor contradicts your version of the story, claiming it has done everything by the book and your complaint is unreasonable?

The following letter was received from a reader in Tasmania who purchased a system from Beyond Computers in NSW.

Dear APC

I was unsure whether to write this or not. However, recent events prompted me to go ahead regardless. To cut a long story short, I have experienced what can be described as nothing less than a nightmare dealing with Beyond Computers.

I purchased a $5,640 computer from Beyond some eight months ago. I am a university student studying second year software engineering and, as such, I rely on my computer system tremendously for my university studies. I also do part-time consultancy-based work including programming, graphic design, and HTML. Because of these factors, having a working computer system is obviously vital to my lifestyle. As a student, I spent an enormous amount of money on my system, however I thought that the cost would be easily justified given the above factors.

Upon purchasing the computer system, there were immediate and obvious problems, including a lack of soundcard drivers, faulty CD audio cable, and grossly defective monitor. It took me six months alone to get the problems with the audio cable and soundcard rectified. This required constant pressure in the form of telephone calls to Beyond's staff, costing me over $140 in STD charges for this matter alone.

Unfortunately, due to incredibly bad service from Beyond, all the problems have still not yet been rectified. As a result, I have had a largely unusable computer system gathering dust for the past eight months while I struggled to gain some kind of satisfaction from the company.

I find it appalling that a customer such as myself who has paid so much money for a computer system can be treated so badly. A company salesperson told me that if I were to speak to anyone about this matter I could be faced with defamation charges.

I feel very strongly that other members of the public should be made aware of the risks of encountering problems such as mine when purchasing computer systems.

Emerson Clarke
Sandy Bay, Tasmania

Two days later, we received a response from Beyond Computers with a covering letter stating that the reader was "pretty well-known" within the company for making "unreasonable" complaints and that the "cost involved in servicing this customer has already been a lot more than the original profit of the sale".

Beyond was adamant, however, that it had tried to address the problem in a "prompt and professional manner" and that Beyond's staff "always try their very best to help customers" and "make sure that goods purchased are to the customers' satisfaction".

Beyond's response was quite lengthy so we have had to paraphrase some sections:

Dear *APC*,

The customer purchased a computer system from Beyond Computers on September 6, 1996 and soon after notified Beyond of problems relating to the soundcard and audio cable. The matter was looked into by our service department who found the following:

The soundcard was an OEM version — these do not come with manuals, drivers or accessories. At the time, the SB32 Plug & Play card was newly released and did not come with Windows 95 drivers or 32-bit drivers. However, Beyond did supply the customer with manuals and 16-bit drivers for Windows 3.11. Soon after, Windows 95 drivers were available on the Internet and the customer was informed.

With regards to the faulty audio cable, this was a genuine fault only found and later confirmed by our supplier shortly after the customer reported the fault to us. Creative's instruction was that on the audio cable, the wiring had to be reversed to gain full functionality. The alterations fixed the problem that the card had but the speakers produced only mono sound.

[Beyond says the customer ordered the system using its online order form and that "at no time did the customer request full retail version of any of the products used in his system".]

As for the customer's NEC XV17+ monitor problem, Beyond actioned the complaint as quickly as possible. Beyond contacted NEC. A brand-new replacement monitor was given to the customer directly by NEC.

A couple of weeks later, Beyond received calls again from Mr Clarke. He claimed that he was not happy with the replacement and that the unit had the same problem as the first one. Beyond again contacted NEC for the customer.

Mr Wayne Hughes, Beyond's account manager in NEC, agreed that if the customer took the monitor to a local service agent of NEC in Tasmania to have the unit tested, a replacement would be offered if the monitor was found to be faulty. The monitor passed the inspection and no fault was reported.

The customer was unhappy with the report and called both NEC and Beyond to complain. This time the customer wanted to upgrade his monitor to a Sony 17+. Due to the problems with restocking and also because no fault

CONSUMER

Tell us all about it

Service & Reliability is *APC*'s consumer column. We invite you to send details of your buying experiences to:

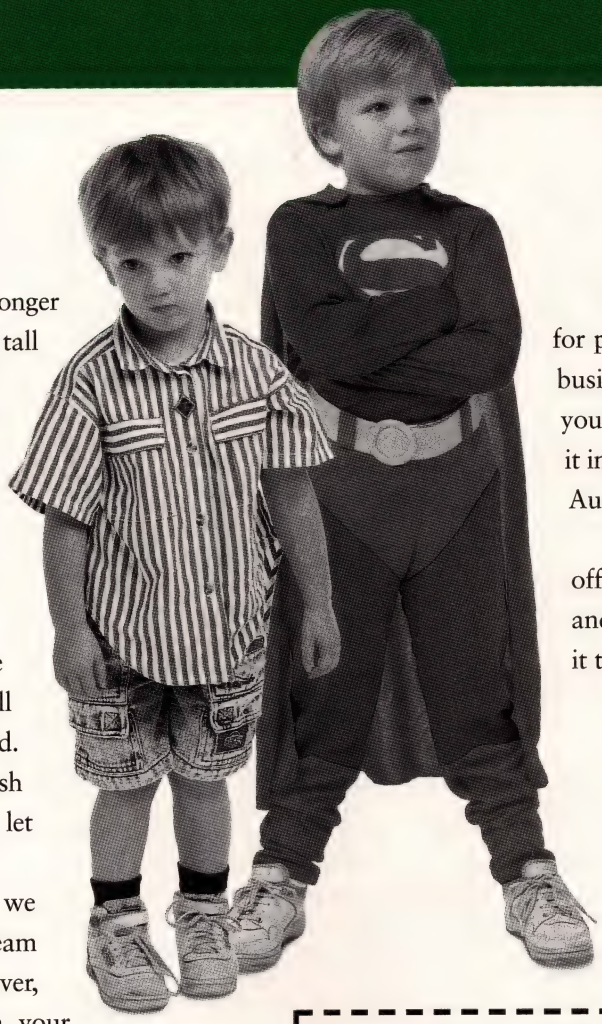
email complaints@acp.com.au
fax Service & Reliability at (02) 9264 6320
mail Service & Reliability, Australian Personal Computer, PO Box 5252, Sydney NSW 1028.

Please keep your letters to no more than 300 words. All letters must contain a full name, address and contact phone number.

APC reserves the right to edit any submitted material for length and clarity.

We can publish only a selection of letters each month and regret that letters cannot be answered personally.

If these 3-year-olds had your business vision which one would be yours?



Faster than a speeding bullet! Stronger than an obstinate banker! Able to leap tall sales objectives in a single bound!

Is it a dream? Is it an urban myth?

No, it's your business vision. Or at least it's how you looked when it all began. Optimistic. Indestructible. Focused.

Visionary.

Until business reality (that's the other guy) sneaked in one day when all kinds of distractions had you off guard. Now it's a daily battle to generate cash flow, control costs and pay the staff, let alone produce some profit.

We don't have to tell you (but we will anyway) that keeping your dream alive is easier said than done. However, there's one sure-fire way to sharpen your business vision, or reclaim it if it's lost.

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No other financial software puts you on top of managing your business quicker or easier than QuickBooks.

QuickBooks is written in plain english, is easy to use and simple to understand. So unlike other software packages, you don't have to be a computer whiz or an accountant to work it out.

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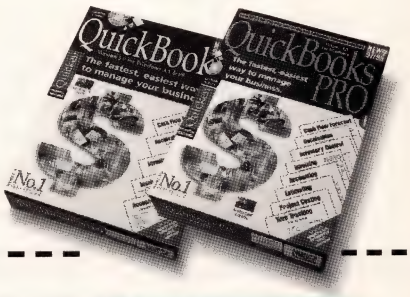

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was found with the previous monitor, Beyond did not suggest the upgrade. However, the customer insisted and rang many times, asking every single retail salesperson of Beyond for pricing, but not giving his name.

Finally, after much bargaining, one salesperson gave a firm price which included freight costs of both the NEC monitor to Beyond and the new Sony monitor to the client.

The customer contacted the salesperson about a month later to inform them that the Sony monitor had the same problem. This is most unlikely to happen! Two completely different brand and model monitors should not have the exactly the same problem. [Beyond says it contacted an agent in Tasmania to test the unit but that the agent was unable to get in contact with Mr Clarke.]

In summary, Beyond Computers believes that its support and sales staff provided an exceptional quality of service to the customer. We feel that our efforts were not appreciated. Beyond does not think that the complaint this customer has made is reasonable.

Yours faithfully,
Graham O'Donnell
Customer service supervisor

When Beyond Computer's response was put to Mr Clarke, he said he was dumbfounded and frustrated, despairing that "not once has Beyond accepted responsibility for this matter", and that the company had "never apologised for the insurmountable inconvenience and hassle" it had caused.

He went on to criticise Beyond's response letter sentence by sentence, stating the following: that he was not informed where to get soundcard drivers ("nor should it be the customer's responsibility — a computer should work when it is purchased"); that the audio cable problem itself took six months to rectify; that he specifically requested retail versions of all products; that the NEC XV17+ monitor problem which Beyond claimed was actioned "as quickly as possible" actually took eight months; that he had to contact NEC himself to have the problem resolved; that the monitor was not tested by the NEC agent as claimed by Beyond; and that the Sony monitor did not have the same problem as the NEC monitor, as stated by Beyond.

In cases such as this, the state Fair Trading and Consumer Affairs bodies (refer to *APC* August, page 64 for details) offer a mediation service where an officer from the department will negotiate to reach a fair outcome for both the vendor and consumer. The department does its best to resolve the problem at this level. However, should the mediation process fail, the next step to take in this situation is to go to the Consumer Claims Tribunal.■

Entry-level SOHO PCs

Continued from page 65

for several days while it sits in a queue waiting to be serviced. Gateway 2000 includes an onsite warranty for the first year of its three-year warranty, and Business Works offers an onsite service for the first three months of a three-year warranty.

Most dealers quoted a 16x CD-ROM, but Sydney-based Surry Hills PC suggested a 12x, and Queensland Computers offered a free upgrade to an 18x. The representative from Distinct Computer Solutions advised there is currently little difference in price between a 12x and 16x. Melbourne-based South Pacific Computers is to be congratulated on its after-sales service. The company runs free training courses for all customers at its premises from 6.30 to 9.30pm weekly. In a market where margins are tight, it is encouraging to see dealers taking an innovative approach to service.

All representatives were polite, although the degree of customer service varied. The representative from Distinct Computer Solutions was the only person to phone after faxing through a quote to see if we required further information. Most were prepared to simply provide a quote over the phone without adequately assessing our requirements. The Business Works representative was the only exception, spending several minutes in the initial stages of our conversation discussing our anticipated use. Nearly all dealers provided follow-up information, with the only exception being the Melbourne-based Computech representative, who said she didn't have time to fax pricing and specifications.

Prices varied considerably and, while the configurations were reasonably consistent, additional costs may partly be explained by the quality of sound and video cards recommended. This needs to be taken into consideration when running comparisons. The least expensive quote came from Queensland Computers, at $1,510. Interestingly, the representative recommended an IBM P200+ rather than a Pentium 200, advising that it is much faster, and costs $180 less. Surry Hills PC quoted $1,820.

Gateway 2000 came in as the most expensive at a hefty $3,547 for a system that included Windows 95, Office 97 (which sells for around $350 for the standard upgrade version), and a choice between MS Generations, CD Games Pack or Websters Educational Bundle. Gateway's pricing is exclusive of postage and handing, although this was not mentioned over the phone. The only other dealer to fall into the above-$3,000 category was Business Works, which quoted $3,400. As mentioned above, the representative took the time to understand our requirements, and recommended a high-quality sound and video card, which would partly explain the higher price tag. Most dealers quoted on a 1M or 2M video card, whereas Business Works suggested a 4M card.

All other PCs were priced between $2,080 and $2,645. As expected, this is consistent with pricing from 12 months ago, but your dollars buy twice the speed and power. First-time buyers may need to also include the cost of additional hardware such as modem, printer and back-up option, as well as office-automation software if it isn't part of a bundle. There is likely to be much more leverage in the price if you are purchasing the entire kit from the one dealer. Don't forget, prices are always negotiable.■

Our charter and method

Price Watch is an exercise in comparative technologies, relative prices and human nature. All investigations are conducted anonymously, and records are kept of conversations. Prices and system capabilities printed here are provided by the sales staff at the offices we contacted, and all information is as supplied. While we assume that these are correct, we cannot accept any responsibility for errors or omissions. Neither will we be held to account by companies mentioned here for omissions to product ranges or system capabilities. The responsibility rests with sales staff to provide adequate information, as the company would expect them to do with every customer.

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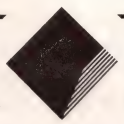

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Virtual network technology holds great promise, but maturity will be some time in coming. **By Angus Kidman**

Building a better network

Like the systems that ride upon them, PC-based networks have evolved in a haphazard rather than a planned fashion. As new groups of users have demanded access to PC technology, extra servers and associated equipment have been installed on an almost random basis.

While many companies have devoted considerable effort to evolving a policy for network implementation, rapidly changing technologies have rarely been a part of that plan, and business pressures have often demanded speedy rather than considered implementation. A study conducted earlier this year by Forrester Research found that 66% of large corporations rated their distributed computing management systems as either fair or poor.

Such a policy is not sustainable indefinitely, however. According to John Matthews, a principle consultant at research firm Ovum, the networking infrastructure of most corporations is fundamentally changing as companies strive to overcome increasing congestion. Congestion can often be a result of poor planning, but also reflects the evolution of network-dependent technologies such as electronic mail.

"Nowadays, email has all sorts of attachments," Matthews said. "It's moved from being a few hundred kilobytes to many megabytes." While higher-bandwidth technologies like Fast Ethernet may help solve this problem, they are of only limited utility in situations where large numbers of users are competing for a limited amount of bandwidth.

Faced with these challenges, many companies are looking to switching technologies as a frontline solution. "Lots of organisations are putting Ethernet switches into their LANs to help cope with the growth in network use," he told *APC*. "Ethernet is very good for the workgroup, but for the network you need something stronger."

That may well prove to be ATM, which is achieving a success in broadband environments that has eluded it at the desktop. "Sales of ATM switching for the broadband network have grown dramatically during 1996," Matthews said. This combined ATM/Ethernet mix will become the dominant infrastructure for many organisations, he predicted.

But the challenge doesn't end with finding a basic networking solution. Companies are increasingly attracted to the idea of implementing 'virtual networking', where membership of a network is more flexibly defined through software,

rather than being purely hard wired. "Typically at the moment, the LAN is based on actual physical connections," Matthews said. "The virtual LAN will enable you to define membership irrespective of the actual physical connection. In the next few years, the ability to create a virtual LAN is going to be an important part of the development of the networking environment." Potential advantages of virtual LANs (VLANs) include easier user management, better utilisation of bandwidth and containment of broadcasts (messages widely used by most current networks to locate and identify particular parts of the network).

While much emphasis on virtual LANs, and associated technologies such as extranets, has focused on the software needed to create them, hardware also has an important role to play. Fortunately, diverse technological directions can converge in this area. Implementations of virtual networking technology via LAN switches show considerable promise, according to Matthews. He warned, however, that such systems are unlikely to reach full maturity until at least 1999. "It actually takes much, much longer for new technologies to come in than everyone thinks at the time", a prediction backed up by other research firms. The Yankee Group, for instance, doesn't see virtual networking technologies as providing a useful solution within that time frame, and has cautioned against their widespread deployment.

Matthews bases his prediction on a series on ongoing tests which Ovum is carrying out on Ethernet and ATM switching products from leading vendors. So far, it has examined products from Cisco, 3Com and Madge, and plans to carry out more evaluations and include additional vendors over the coming year. Ovum's assessments rated the products for their overall functionality, and also for their ability to implement a virtual LAN environment. (The full report, *Ovum Evaluates: LAN Switching Solutions*, is available for $3,595.)

While Cisco narrowly beat 3Com to come at the top of Ovum's ratings, Matthews cautioned that results were close and no company had a clear technology lead. "No-one is sufficiently strong in this marketplace to displace another vendor [from a company already using specific technologies]," he said. "People are being pushed by the congestion problem to do something, but there is no single solution that is going to be widely accepted."

A key determinant may be the long-term strategies adopted to implement virtual networks, which differ markedly between the three firms Ovum examined. Of these, 3Com's is arguably the most innovative, Matthews said, since it is based around the use of Java technology to create the VLAN implementation. While this is a sound basic strategy, it will require considerable work to implement.

Cisco, in contrast, has adopted a strategy of policy-based VLANs. This provides a solid solution for Layer 2 VLANs, according to Ovum, but requires development before it can be effectively implemented at higher levels. "They're only really beginning to think about how they're going to address that," Matthews said.

While characterising Madge's VLAN strategy as the least advanced of the three, Matthews said a more pressing problem for the company was its basic support and information services. "They don't actively release as much information as their other competitors," he said.■

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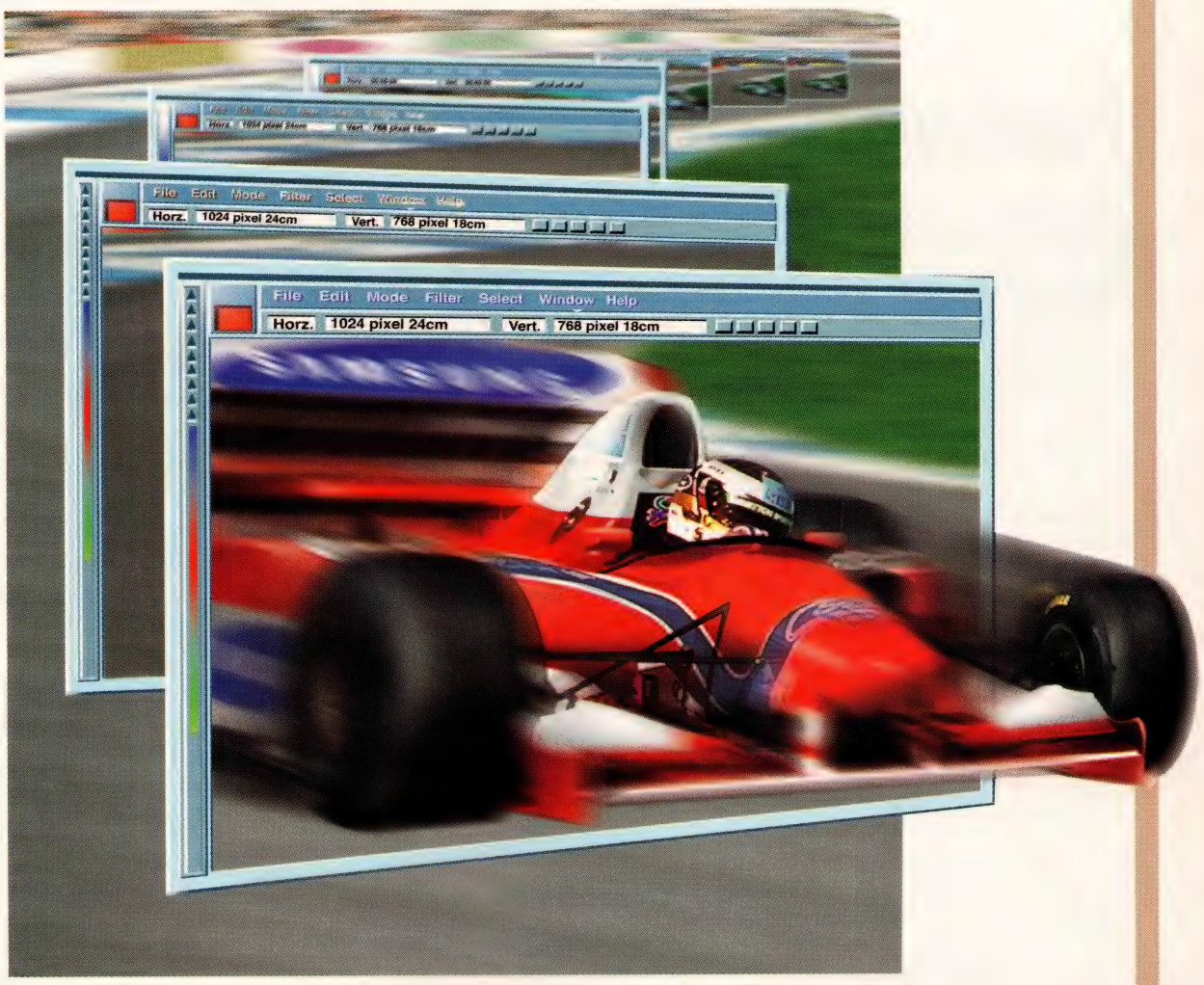

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SAMSUNG ELECTRONICS

Having all your computers on one linked system makes sense in a lot of ways, but it can also bring a few pitfalls to the unwary business. **By Jeremy Torr**

Networking or notworking?

With the advent of quick and relatively easy networking from Windows for Workgroups, the need for a complex and labyrinthine network subsystem working at the DOS level vanished for ever — at least in the small business community. And now that Windows 95 and NT offer not only quick and easy but also relatively stable networking, the potential for networking your business is better than ever. The single most important decision to make now is not whether you can network, but whether you should network at all.

Workflow improvement

Before any business employs a network, it should ensure it will improve the workflow, cashflow or service delivery. If there are any doubts about any of these issues, it may be the case that running without a network is the best answer.

If your business uses a typical small office layout, with at least two or three PCs, and makes full use of the available computing capability — that includes data entry, printing out invoices or receipts and downloading information — more than 25% of the time, then networking is a possibility.

Of course, if you are running a garden centre with an accounts clerk coming in to keep the books current twice a week, the need for networking is somewhat less than if you are operating as an engineering consultancy with several CAD/CAM stations plus a very busy client list and email setup.

The advantages of using a network are that you will usually make better use of resources. Instead of having an overpowered and expensive PC on every desk just in case, you can get away with cheaper yet adequate units linked to one print and file server. Likewise the number of printers, modems and scanners will equate to overall use, not simply the number of desks there are.

This makes much more economic sense, and allows a longer life cycle than with standalone machines. It also offers much better group working in a busy office, as email and group scheduling can proceed alongside, instead of in place of, other tasks.

The other big advantage networking brings is instant access by all workers to common or shared files such as customer databases, work proposals and price lists. This brings big time savings as any 'holder of the stockroom key' queuing problems disappear.

Networks also bring advantages to medium-sized businesses in the form of licensing savings. Instead of having to buy a separate package for each desk at full price — no matter how little functionality is used — the company can buy a network licence at a much lower price per user. Upgrades will also usually be easier, as the software can be upgraded just once on the file server.

Consider the expertise

However, there are also disadvantages to consider. First, a network will almost always need slightly more administration than individual machines, and will demand an extra level of expertise should system crashes occur. This also brings with it the potential for greater business-wide downtime. If a single standalone desktop crashes, that worker will stop. If the network goes down, everybody will stop.

If a single standalone desktop crashes, that worker will stop. If the network goes down, everybody will stop.

Another more recent problem that affects both standalone units and networks, but affects networks faster, is virus infestation. A virus on one machine can be isolated if it is discovered quickly, while a network, virus policing is much more critical, especially if there is a regularly used Internet connection. In any case, having a single sacrificial machine separate from the network is always a good idea if there is a likelihood of viral infection. Viruses don't just cause downtime, but damage too. The less the damage can spread, the better.

Although the equipment that can be used on the desktop is potentially cheaper for a network thanks to centralised storage and printing options, the cost of cards, cabling and installation should be considered too. This can often counter the savings made in other areas.

In any situation, the business should consider the merits of any potential network before going ahead with the installation. The most important issue is obviously the benefit to the business. If the benefits are hard to quantify, the business should look very carefully at the risk involved. Should this outweigh the advantages — especially in those grey areas such as user familiarity and usability — then the best approach may be to postpone the network altogether.

With increased use of the Internet some businesses are using this as their surrogate network, with users logging on and off and sending emails and files as required. The advantage here is that each node is temporary and can cause no problems to other users. Extending the 'internetwork' is simple and inexpensive. If your system works adequately without a network, then it is paramount to ensure the network will bring tangible benefits, and not merely add another layer of complexity to your working environment.■

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Business-productivity applications might be all very well in the workplace, but are they appropriate tools for the schoolroom? **By Martin Levins**

If it's Excel, it must be Maths

Maths does Excel, English does Word. Is this because a spreadsheet is a 'Maths thing' and word processing is an 'English thing'? Or is it because the kids will need to 'be prepared for the workforce'? You know the rationale: 'These kids are going to be in the workplace in a few years so they'd better know how to use Microsoft Office'.

As a teacher, I can't see this as being a worthy aim of education. How can we decide which suite of tools to teach? How will this resemble the applications used when the student leaves school anyway? You can bet that the word processor of today will not resemble that of six years hence. I believe that schooling our students in the use of one suite of office-based productivity software is a fairly useless activity (and not just for the reason outlined above).

Look at the way most computers are used in most businesses. Two or three specific pieces of software (at most) are used to accomplish a specific series of tasks in a fairly well-defined workflow, for which employees are trained mostly in-house. Procedures, data, inputs and outputs are all clearly defined.

Those clear definitions can't be applied to teaching, however. This involves problem solving, research, group productions and presentations. And, if we are best going to prepare students for a business environment, we need to concentrate on these, so that when new technologies or opportunities arise, they can deal with them.

For example, a lot of businesses today are dealing with the problem of reworking existing corporate documentation for multimedia or Web presentation. Leaving aside the file-conversion problems, the existing paradigms don't fit; people negotiate online information in a different way. New skills are needed that didn't exist before. We won't have trained our children adequately if we merely teach the ins and outs of specific software.

Even when we use 'business-productivity tools', the way that they are used is questionable. I've seen spreadsheets being used as a fancy calculator plenty of times; I've seen them being used as a 'what-if?' modelling tool much less often. I've seen word processors used mostly because they produce pretty output and because they contain spelling checkers; rarely because they allow efficient editing of idea flow and structure using an inbuilt outliner.

Students (and teachers) should know when it is appropriate to use a computer, but they should also know when a computer-based solution is inappropriate. Do they demonstrate this now by choosing the best from an array of tools, or do they go straight to the machine because it is a more attractive option? Computers (and most technology) can be so seductive that they create a powerful determinism that often inhibits creativity and efficiency. What does this mean?

Try giving someone a task in the presence of computers. What do they do first? My experience is that they will move straight to the keyboard, rather than thinking about it for a while — maybe sketching with a pencil. Because they have gone to the computer first, their creativity and problem-solving horizons have suddenly been curtailed.

For this reason, I often tell my students that the first step they should take when developing a computer-based solution is to turn the computer off. In this way, they are able to think outside the square that is the computer or, more accurately, their perception of what the computer system can do.

When their ideas are conceptualised on paper or through discussion, they may then find compelling reasons to not use the existing system, or determine that it is not capable of the task in its present form. This in turn makes them more highly motivated to learn new software or new ways of doing things. This is a better road to a satisfying product, but it requires a different approach to 'learning how to use computers'.

Sure, word processors and spreadsheets are important, but they aren't the only pieces of the puzzle. We have to look further, otherwise we run the risk of letting the software determine the learning outcomes.

Consider this: students are asked to design an advertisement for the book they are reading in English or the object they have fashioned in the workshop, maybe a travel destination for a geography or language class, or perhaps a military-recruiting program for a history class. Perhaps they are in a Maths class, trying to work out the best shape and size for a can of soft drink. This task should be produced in a variety of forms and formats: poster, brochure, film or multimedia, according to the angle that the students want to take and the intended audience. How do teachers cope with the myriad applications?

One way to solve this problem is to develop 'just in time' learning of software tools — I want to build a screen-based presentation, so that's when I learn PowerPoint. This differs from the 'just in case' model where ways of doing things are learnt in case they need to be used sometime in the future.

The 'just in time' model requires a change in the way we manage learning. It implies that a 'software guide' is available almost on demand to teachers (or groups of students) who need assistance. Is this in operation at your school?

Martin Levins is director of computing at the Armidale School.

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In this information age, do we really need to be there, or can we save costs, time and energy by holding conferences online? **By Selina Mitchell**

Virtually there

As the Internet becomes easier to use, and more people are converted to online communications, virtual conferencing is increasing in popularity. NASA is doing it, so is the UN, the Ergonomics Society of Australia and even the Chartered Institution of Building Services Engineers (CIBSE). While most virtual conferences are conducted in English, some are supplying information in various languages to break down even further the geographical, cultural and social barriers associated with 'flesh' conferences.

While it can be expensive to set up a virtual conference, most who have done so believe the benefits outweigh the costs. Providing the option for interested parties to stay at home and work and access a conference in their own time broadens the opportunities for discussion, and the number of people who can be involved. For the organisation, a virtual conference provides access to, and feedback from, a wider audience.

A virtual conference is not a simple affair to organise, nor is it inexpensive, but once the development work is done and the shell is in place, subsequent conferences become more cost effective. They are usually held in conjunction with a land-based conference, so the papers and discussions are already organised. Probably the most difficult part is transferring this information to electronic format. Supplying the means to comment on it and other issues is a matter of creating the appropriate frames, forms and tables. Graphics are often kept to a minimum to speed download times.

For the virtual delegate, there are plenty of advantages to not being there physically, said Grahame Gibbs, who was so impressed with the CybErg ergonomics virtual conference he attended last year (http:www.curtin.edu.au/conference/cyberg) that he decided to organise one for an association he is involved in. Delegates can travel large distances via the Internet almost immediately (with no transportation costs above the cost of the call and the service charges), physical and time constraints are relaxed, and participants can assess large amounts of data and information before placing questions.

They can shift and fragment the conference to suit their own needs, and experience a multimedia event, said Gibbs. They also enjoy the benefits associated with attending a conference in the flesh, such as collecting new information and establishing new contacts.

Finally, there is an associated benefit that affects even people who don't know the conference exists — world energy resources are not strained by freighting people across the globe unnecessarily. Even for those without a computer, purchasing the necessary equipment (system, software and modem) is often cheaper than paying for an airline ticket and accommodation, as relevant conferences are often located in Europe and North America.

This concentration on the above locations creates another problem, for which a virtual conference provides the solution. One major reason for conducting the CybErg conference was that organisers were trying to avoid a Western industrial bias in discussions. High attendance costs mean that most people who attend international conferences come from the host country or area, so often European and North American delegates, and their views, predominate. If cheaper access is provided through other means, then more people representing more cultures can provide input. The September CybErg conference had 1,000 participants from 34 countries.

Another virtual conference, held as part of Global Knowledge 97: Knowledge for Development in the Information Age, was designed to allow those with Internet access to participate in debate, to connect with interested groups, and interact with conference participants (http://www.globalknowledge.org/graphics/virtual_conference.html).

The event drew about 1,100 subscribers from 67 countries around the world, said Janice Brodman from the Education Development Center, who organised the conference. "One of the most exciting things about [it] is that it has a comparatively high proportion of members from developing countries," she said. "The statistics on overall Internet use show that 90% of Internet users are from US and Canada and most of the other 10% are from Europe and Australia. In contrast, about 25% of the members are from developing countries."

Gibbs said the centenary celebrations of CIBSE would involve a virtual conference. The £97,000 conference will use a high-performance Web server protected by an online uninterruptible power supply and connected to the Net using a 2M optical fibre leased line. It will include real audio keynote papers, virtual reality displays and exhibitions, and a CD-ROM of conference events.

The CybErg conference was a less expensive affair, said Curtin University of Technology's Dr Leon Straker, one of the conference organisers. It cost $15,000, but development time and equipment were paid for by the university. Big-budget items were publicity, programming and secretarial time. It was important to minimise access problems to the site, he said, so they decided to provide low-bandwidth-dependent data. (Other sites provide graphics-intensive and text-only versions for delegates.)

Nonetheless, bandwidth remained a problem, said Straker, and he predicted that it would still be a problem with the next conference in 1999. He said virtual conferences would be complementary to flesh conferences. The latter will remain important, but because they cost so much, attendance was not always possible, even if it was preferable, he said.■

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Original cybergonzo

Brock Meeks, creative force behind the controversial Internet newsletter Cyberwire Dispatch, tells APC's **Dan Tebbutt** *why the computer press is not doing its job properly.*

Where is all the hard-nosed, down-in-the-dirt investigative journalism when it comes to the computer and online industry? That was the question posed by Brock Meeks, legendary author of the irreverent but always hard-hitting online newsletter, Cyberwire Dispatch (CWD), when accepting his second Computer Press Association (CPA) award in June.

"The fact is, journalists covering this industry give it too much of a free ride," he said. "The industry is making profits that border on obscene. And when there is that much money at stake there is dirt, big time dirt. But few are looking."

It was classic Meeks, a profanity-laced brand of investigative gonzo journalism that specialises in airing the high-tech world's dirty laundry. CWD earned its award this year with a story exposing the hidden agenda of Internet blocking software. The story, written by Meeks and Declan McCullagh, revealed how "nefarious" software like CyberPatrol and CyberSitter actually goes way beyond mere porn filtering. CWD showed how unexposed political motivations obstructed legitimate sites such as the US-based National Organization of Women, gay and lesbian information and even critics of blocking software such as Peacefire (see *APC* May, page 68).

What sets CWD apart is its deep probing of serious issues coloured with Meeks' entertaining reporting. The award-winning 'Keys to the Kingdom' piece featured wild, semifictitious tales of drinking and a cross-dressing source who cracked the blocking software's encrypted lists.

Theatrical flair probably explains why, according to Meeks, Mitch Kapor (founder of Lotus Development and co-founder of the Electronic Frontier Foundation [EFF]) called CWD "the first brand name created in cyberspace".

"There is so much noise in cyberspace that you have to be larger than life," Meeks recently told *APC* in Washington DC. "Gonzo journalism that's rooted in and based on hard-nosed factual reporting is a way to stand out. It makes it entertaining, it fits with my personality, and it makes it stand out above the rest."

Facts and investigative skills are always at the heart of CWD reports, according to Meeks. "Where I depart from traditional 'objective journalism' (which I think is bogus anyway) is that I go on and give my opinion: I give both sides of the story, then explain why one is just blowing smoke. The readers respect that," he said.

Hunter S Thompson is an obvious comparison, but Meeks insists he first read the father of the gonzo genre only in 1995. A youthful 41, Meeks has enjoyed a long and varied career. He's always been geared towards investigative news, cutting his teeth on newspapers. This included a stint covering wars in Afghanistan that earned Meeks wounds and several journalism awards.

Inside the computer and telecommunications press, he has written for *Byte*, *PC World*, *Inter@active Week* and *MicroTimes*. He covered the "torturous" 1996 US presidential campaign for *Wired*; like some other former employees, he's scathing about *Wired*'s tendency to "pretend that attitude can substitute for news".

Presently, Meeks works for MSNBC, a rather unlikely twist for a man who once openly lambasted journalists working for Microsoft. As head of the joint venture's Washington bureau, he contributes mainly newspaper-style reporting and even a bit of television. Meeks professed not to like Microsoft or its business practices and threatened to quit if MSNBC ever "soft-pedals" Bill Gates's empire.

Continuing CWD without constraint was a condition Meeks demanded before agreeing to join the multimedia network. He believes the organisation has never given Microsoft soft coverage because it operates as part of the NBC network's news department, sealed off from Microsoft. He claims

the only contact between MSNBC and the co-parent is "to bitch about their software", adding: "MSNBC is totally different [from] Microsoft Network. The only thing we take from Microsoft is [its] money!"

Meeks started his electronic newsletter in January 1994 while covering DC's Capitol Hill for *Communications Daily*, a respected telecommunications newsletter. "I started it because I saw an increasing number of people coming online and an increasing number of journalists that were passing around information as if it were truth when it was obviously false," he recalled. "I started it to counter all this disinformation."

Originally the missive had no name, just the now-familiar taglines "jacking in from . . . port" and "Meeks out" (inspired by Neal Stephenson's *Snow Crash*). But when a story on FBI wiretapping research was "pilched" on the front page of the *New York Times*, colleagues on the WELL (where Meeks was a member since beta testing in 1985) suggested he needed a formal name.

Subsequently, CWD has been cited by *Time*, the *Washington Post* and *The Economist*. In March the *National Journal* named Meeks one of the most influential journalists in Washington, alongside more famous heavyweights like Bob Woodward and Cokie Roberts. CWD also became the first 'home-grown' publication to win a CPA award for its July 1995 exposé about the flawed undergraduate study of Internet pornography that *Time* magazine used for its infamous 'Cyberporn' cover story.

Meeks believes more searching reporting is required to hold the computer industry accountable. "It's mostly been the trade press that has kissed up to the industry or not looked at the industry critically enough," he said. "This industry is still ripe for hard-nosed, investigative reporting that takes a serious look at their business practices, the work ethics and habits. That's what I try and do."

The stated aim of CWD is "to piss off as many people as possible — to be a thorn in the flesh of the power structure, no matter if it's corporate or political. It's a take-no-prisoners style of journalism that aims to tell the truth and let the chips fall where they may. I'm not afraid of making enemies: in Washington, that's almost death for a reporter.

"If I'm going to be tagged with anything, it's that I'm tough but fair," Meeks said. "I'll write critically about anybody."

He sees "another part of the mission" as educating the online public about how to play politics Washington-style. "You can't just stick your head in the sand and say all these people are evil — they have their valid points too. If you understand where they're coming from, you can better target your arguments so it's not just a knee-jerk reaction. It can be a reasoned, polished defence of your position and an attack on them.

"The success and longevity of Cyberwire Dispatch has proven that I strike a chord with my readers," claimed Meeks.

Estimating *CWD*'s readership is no easy task, but Meeks himself offers 800,000 as "a wild-ass guess". The original goes out through three listservs with roughly 350,000 subscribers. Additionally, Meeks claims it is redistributed to around 300,000 readers within the US Federal Government, including the Pentagon, FBI, Federal Communications Commission and Commerce Department. Frequent Usenet and email repostings among friends and professional colleagues means CWD is carried to potentially millions of readers.

Meeks said it's "not unusual" to receive 1,000 responses to big CWD articles, including an obligatory dozen or so complaining about expletives or his poor grammar.

CWD remains totally free, notwithstanding Meeks' mirthful threat to double the subscription fee following recent accolades. "I get a big kick out of the fact that it's free and oftentimes will kick ass on the big publications for free. I've thought about charging for it but it's too much hassle right now.

"I will start charging for it when we get a system in place for electronic commerce where micropayments are ubiquitous. When that happens, I will start charging five cents or less. At that point, I become a millionaire!

"The other thing I like is that there is an intimacy and immediacy that I have with my reading public. There is not a publication in the way: it's me and the reader. I'm totally responsible for that publication and I don't have a boss. My boss, if anybody, is the people that read the work. I know if I make a mistake I'm going to get hammered, and that makes you a better journalist. I put myself on the line, like a comedian that has to go on stage live. It's scary and exhilarating all the time."

Meeks faced the flipside of that naked-ness in 1994 when he became one of the first reporters sued for libel in cyberspace. The case was resolved without admitting liability, but Meeks complained that it cost $US30,000 in legal fees to defend an accurate story. Some of that money was recouped through an online fundraising appeal that demonstrated the CWD community's loyalty.

Despite that ugly brush with the legal system, he remains enthusiastic about the online publishing revolution. "Anybody can do it. It doesn't take a vast amount of resources. Anybody can have an impact: whether they're writing from North Dakota or Australia, they can have an impact *worldwide*," said Meeks.

The stated aim of CWD is to "piss off as many people as possible — to be a thorn in the flesh of the power structure."

"People working for the *New York Times* don't have that kind of impact."

Quality is vital, nonetheless. Meeks agreed with *APC*'s analogy with the early days of desktop publishing where people got carried away with the technological possibilities, often using every available font in their newsletters.

"Just because you can do it, doesn't mean that it's good," he said. "You still have to have talent. There are people out there putting out so-called journalistic products that are just shit because they don't have talent. They're not journalists, they're wannabes — and it shows.

"Just because it's easy to do and there's a low point of entry doesn't mean it's gonna be a good product."

In spite of his vocal cynicism of computer journalism, Meeks admits his respect for Josh Quittner (Pathfinder and the Netly News), Dan Gilmor (*San Jose Mercury News*), Gerard Sandberg (*Wall Street Journal*), Simson Garfinkel (freelancer featured in *Wired* , *SJMN* and *Spin*), Elizabeth Weise (Associated Press) and John Schwarz (*Washington Post*).

Meeks believes CWD fills a much-needed role in cyberjournalism. "Sometimes people have said, 'You're just preaching to the choir because you're online and most people online agree with you.' So I'm preaching to the choir! These people aren't going to read this in their daily newspaper, and they want to get news about what's important to their community online, and they get it from me. What's so bad about that?"■

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DOT PITCH	0.28mm	0.28mm	0.28mm	0.28mm	0.26/0.28mm	0.26/0.28mm	0.26mm	0.28mm	0.28mm
HOR. FREQUENCY	30~50KHz	30~50KHz	30~64KHz	30~69KHz	30~64KHz	30~69KHz	30~88KHz	30~82KHz	30~69KHz
MAX. RESOLUTION	1024x768	1024x768	1280x1024	1280x1024	1280x1024	1280x1024	1600x1200	1600x1200	1280x1024
MICROPROCESSOR CONTROL	Yes	Yes	Yes	O.S.D.	O.S.D.	O.S.D.	O.S.D.	Yes	O.S.D.

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Pocket computing

APC looks at the current state of computing, pocket style.

By Jeremy Torr

Curiously, the size of the average desktop computer hasn't changed much since IBM first came up with the idea in 1981. Despite the miniaturisation of virtually every component involved, the cases remained roughly the same size. But a new breed of machine is being developed. Although these boxes do not fall easily into either the notebook or PDA categories, there is no doubt they will affect the market.

What is it that has made the user in the street start taking notice and spending on pocket computing devices? Early attempts were, almost without exception, stymied by lack of real workability and power, but hardware advances have allowed a resurgence of interest from designers. Still, the units are restricted by power, keyboard and screen parameters. Now it seems the key issue is not total computing independence and mobility, nor desktop duplication or absolute power. Rather, it is the ability to link seamlessly and smoothly with the desktop world — as a complement, not as a replacement. The pocket computer today — no matter what its size and style — will succeed by the way it links to the outside world, not by how much it can do on its own.

What is a pocket computer?

It is easy to categorise pocket computing devices (PCDs) into various camps such as handheld PCs (HPCs), personal digital assistants (PDAs), subnotebooks, personal organisers and the like, but standards are still far from being set. A raft of makers from various manufacturing backgrounds such as calculators, notebooks, and communications are all treading slightly different paths, yet all achieving more success than before. For simplicity, we categorise a pocket computer as something that can be programmed with a variety of software (this excludes the souped-up personal organisers such as those from Casio and Sharp), is designed to be used on battery power for a large proportion of its operation, can be used on its own at a pinch, and can be fitted into either a trouser or jacket pocket. The ability to communicate is obviously high on the list of attributes, too.

One of the real pioneers in this field, and the one that coined the PDA acronym, is the Newton. This was Apple's innovative and brave attempt to bring the portable device to the attention of the

world. The reason it did not achieve the success it deserved was primarily due to marketing, not design. Apple insisted on playing up the handwriting-recognition capability, an aspect that was hampered by both software and hardware and which cast a shadow over the original unit's pioneering design ideology. As a result, the public has been generally scared of handwriting recognition, and consequently most makers still use a keyboard of some description for data entry, although size limitations mean these are not realistic for typing much more than memos. Recently, however, units from Hewlett-Packard, US Robotics and Apple are all scoring successes in the handwriting-recognition area.

Where the PCDs available today really offer extra value is their ability to swap information quickly. Most incorporate dedicated software and communications ports to allow hot synchronisation with a host desktop. This allows them to be used to download data and programs to use as a reference on the road, then upload changes later as required. The advent of Microsoft's Windows CE (Compact Edition) has made a big difference. Now hardware makers can concentrate on the physical design knowing that small-footprint software made to a recognised standard is ready to run out of the box. This approach also ensures full compatibility with the majority of desktops. Plus, of course, there's the ability to at least swap email messages while on the move, and at best engage in full Web browsing via mobile or remote phone line. Rumours of Java-enabled PCDs are also breathing life into the genre.

While all the devices *APC* looked at offer all the basic calendar, note-taking, calculation and communication potential that most pocket users could want, the intended use in the field will be an important deciding factor for buyers. Direct screen input as offered by the Newton and Pilot will definitely tip the balance towards convenience. But the standard Windows interface, extended software set and expansion capability will make HPCs more attractive to many people.

Ultimately, the potential usefulness of these devices depends on four things: useful battery life, size, compatibility and usability. Beyond that, all the extra add-ons and gizmos will never equal the real-world function of a notebook. As long as you fit the machine to the task, however, PCDs can be a real boon to any over-stressed computer user's pocket.

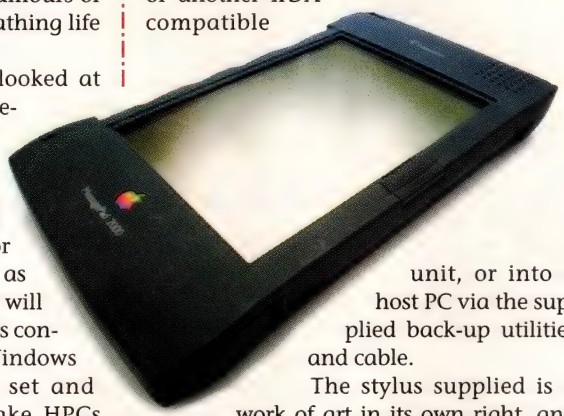
Apple Newton Message Pad 2000

APPLE

What can you say about the Newton? It was a leap of faith in the first instance, it contains some (now) superb handwriting-recognition intelligence, and it is easy as pie to use. Sadly, it is just too big, too heavy and too expensive. The designers seem to be losing the plot.

But if you ignore the size and weight, the Newton MessagePad 2000 is a superb mobile tool. It has everything built-in — handwriting recognition, lovely graphical interface, excellent context-sensitive help, direct printing, Internet browsing, sound, two PC Card slots, a smooth stylus and a bigger and clearer screen than the Libretto (albeit mono).

The MessagePad 2000 uses four AA batteries to power its 160MHz RISC chip and the jumbo backlit screen with its 480 by 320 definition. Memory as standard is a generous 8M of ROM and 5M of RAM, all contained in a fairly hefty chunk of plastic a little larger than a Filofax. Like the Pilot, the MessagePad is designed for use as a jotting recipient for all sorts of data from a variety of sources. But as well as the basic PIM applications, it can provide a reasonable drawing service too. This is where the other PCDs fall down, and the Newton has it wrapped up. Scribbling, text entry and wild doodling can all be swallowed and regurgitated, either as they were entered or as text and graphics, directly onto a printer or another IrDA-compatible unit, or into a host PC via the supplied back-up utilities and cable.



The stylus supplied is a work of art in its own right, and even comes with its own flip-out holder. And the sound quality on recorded messages is also good, considering the size of the speaker. However, for such a sophisticated unit, the ability to schedule group activities, as the Windows CE units do using Scheduler, is very limited. The scheduling and to-do lists aren't much more comprehensive than on the Pilot. Unless you are a Mac missionary, this is a bit disappointing.

Editors' Choice apcmag

- **Philips Velo 1**
- **USR PalmPilot Professional**

The difference between these units is not so much what they include but what they do. All the PCDs included address books, basic word processing, memos, scheduling and a calendar. Some threw in a calculator and some communications software. All offer some kind of desktop synchronisation. But the real advantage these little gems offer is in the usability. It's all well and good to have the most powerful CPU, but if you need more battery power to drive it, will it still be really portable?

Two trends emerged from this PCD review. First, the minimalist approach. The Pilot scores here with a no-frills, take-it-or-leave-it, notebook-style offering that is beautifully simple, portable and very fast, at an attractive price. At the other end of the scale is the Philips Velo 1. This has the advantage of having absolutely everything built in, total Windows compatibility, massive expansion potential and good looks too. But it is heavy and more power-hungry than the Pilot. In the end, given the appeal of the ready-to-run Velo and the true pocketability of the Pilot — especially with the latter's new email capability — it is impossible to choose between them.

Distributor	Apple
Phone	(02) 9452 8100
Online	http://www.newton.apple.com/
Price	$1,699
In short	Could be a winner, but compared to the competition, it is a mammoth.

Casio Cassiopeia

CASIO

The first Windows CE machine to launch in Australia, the Cassiopeia is a good example of what consumer product designers — not computer makers — come up with when they cross markets. This is one of the simpler devices in its field, yet it's quite functional, with features that can be picked up easily by the novice user. The organiser-size clamshell opens up to show the 480 by 240 resolution screen with its switchable backlight. This is one of the physically smaller screens and the back-

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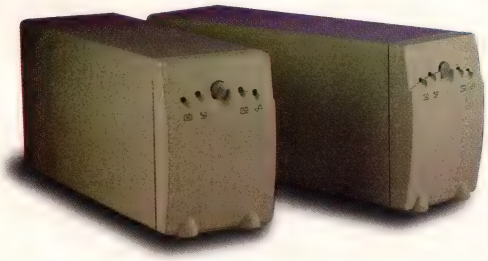

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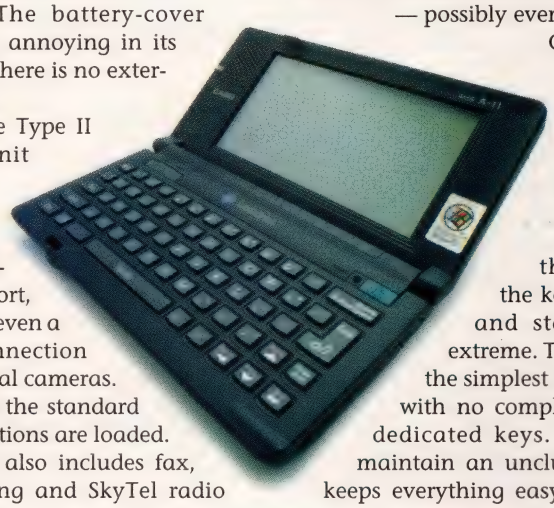
light is rather feeble. The Casio's keyboard is nearly as good as the Philips, with an almost decent space bar.

Practical aspects include the sensible power switch, the easy-to-reach stylus placement and the alarm light which flashes when the unit is closed. There is also a discrete external 'alarm cancel' button. The good design stops at the battery-compartment cover and contrast dial. The latter is infuriatingly easy to knock while the unit is closed, leading to misleading flat-battery shocks on a regular basis. The battery-cover design is equally annoying in its complexity, and there is no external power socket.



As well as one Type II card slot, the unit includes the standard sub-miniature serial cable desktop connection port, an IrDA port and even a direct socket connection for Casio QV digital cameras. As supplied, only the standard CE Pocket applications are loaded. The bundled CD also includes fax, financial planning and SkyTel radio messaging software. In terms of speed, it does not perform as well as the Psion or Philips, and the link process to Windows 95 takes quite a while. However, given the entry price for the 2M model, its overall solid design and good battery life, this is not a bad buy.

- **Distributor** Mobex
- **Phone** (02) 9370 9100
- **Online** http://www.casio.com
- **Price** 2M $899; 4M $999
- **In short** Simple and usable design; a no-nonsense, entry-level product.

Hitachi HPW-10

HITACHI

Looking, feeling and working very much like the Casio, the Hitachi *APC* looked at was a pre-market sample with a mono screen. Later this year should see a colour-screen model using a similar layout and design.

The review sample came in a grey gunmetal clamshell, with a 480 by 240 resolution screen and no backlight, but with very good clarity and readability — possibly even better than the Casio with its backlight. The supplied stylus sits in a hard-to-lose but difficult-to-access under the screen, and the keyboard is plain and standard in the extreme. The 63-key unit is the simplest of any reviewed, with no complex functions or dedicated keys. This all helps maintain an uncluttered feel and keeps everything easy to understand and use. A slight key click helps too, making it the second-most-usable device after the Philips.

I/Os include the serial link port, the obligatory IrDA window and power-in. A Type II PC Card slot completes the gadget-free design — no RAM upgrade is available for the standard 2M or 4M, and there is not even a back-up battery to worry about. The review sample had only standard Windows CE applets loaded, although retail models will be supplied with extra software. The HPW-10 came with NiMH rechargeable batteries as standard. A version which incorporates a modem is expected later this year.

The stylus was a bit like that of the HP — it was easy to misclick and double-clicking was not intuitive at all. However, the keyboard was easier to use than many. The Hitachi was noticeably the lightest of the CE machines, and its round-edged, rectangular case fits neatly into a pocket.

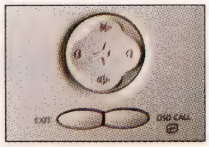
The use of NiMH batteries and no backlight gave a very good battery life — over 24 hours. Overall, a no-nonsense attempt at the basic requirements of CE without adding any bells or whistles.

- **Distributor** Hitachi
- **Phone** (02) 9888 4100
- **Online** http://www.hitachi-ce.com
- **Price** Not available
- **In short** Realistic and practical design for Windows CE, without distracting add-ons.

HP 320LX

HEWLETT-PACKARD

HP's 320LX is the top of its HPC product tree, and its big claim to usability is the screen. It is noticeably larger than the



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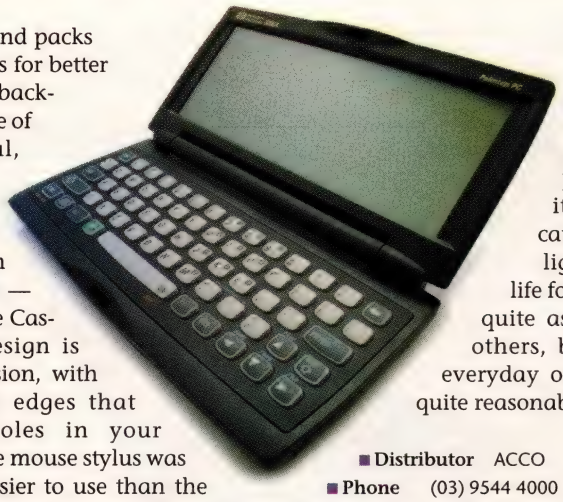
other CE units, and packs 620 by 240 pixels for better resolution. The backlight was also one of the more useful, with a soothing green glow which stayed on until not needed — unlike that of the Cassiopeia. The design is more like the Psion, with nicely rounded edges that won't wear holes in your Armani. Even the mouse stylus was chunkier and easier to use than the competition's overly delicate alternatives.



The keyboard, however, seems a hangover from the smaller HP OmniGo range, and is not as good as many of the others — the keys are simply too close together to avoid accidental hits. Additionally, stylus pressure was sometimes a little tricky to get right when double-clicking icons. On the plus side, the 320LX boasts two slots, one for a Type II card, and one for a standard CompactFlash card to boost memory. This means extra memory and communications can be achieved at the same time, which is very useful. Straight memory upgrades can also be accomplished using a proprietary slot under the front of the keyboard. The unit comes with a neat docking station which allows power to be connected while synchronising with a Windows 95 desktop — handy for extending battery life. An IrDA connector hides under the end panel, and the two AA batteries fit into a compartment at the back of the keyboard.

Application operation was quite fast, possibly thanks to the 4M that came fitted — it uses the same Hitachi chip as most of the others. Supplied software comes on a CD-ROM, but is mainly test versions of US-specific programs, plus a fax utility. Possibly because of the backlight, the battery life for the HP was not quite as good as some others, but in terms of everyday operation it was quite reasonable.

- **Distributor** ACCO
- **Phone** (03) 9544 4000
- **Online** http://www.hp.com/go/handheld/
- **Price** $1,395
- **In short** Top screen, tricky keyboard, good expansion. Well worth a look for any Windows CE devotee.

Philips Velo 1

PHILIPS

It's smooth, it's slick and it has very good specs. Like the Casio, it has been designed by a consumer-electronics company. The difference shows. First of all, the case of the Velo looks cool. It is not quite as rounded as the HP, but has a lovely moleskin finish and some smooth designer insets. Opening the lid/screen reveals a standard backlit 480 by 240-pixel display, the stylus holder and the best HPC keyboard yet. Neat oval buttons that are well spaced and have dedicated functions for CE applets all make it top of the list.

As with the Casio, external alarm lights make a practical contribution, and the stylus, although a bit small, is contoured to be held easily. The standard battery compartment and power socket plus an IrDA window sit at the back of the casing. Surprisingly, Philips has decided that a PC Card slot is not required. This may be a surprise, but the offset is a tiny RJ-11 socket at the side of the screen. This plugs straight into a standard phone-line modem to give direct communications — no power-hungry card required. An optional external V-Module unit can plug in to give Type II card access if required.

Under the case are two standard CompactFlash card RAM/ROM slots. These can take memory up to a staggering 96M maximum. And the extras keep on coming — switch off, close the lid, press a tiny button next to the logo and you can use the Velo as a voice recorder. The resulting sound file is stored and played through a special applet which can be accessed next time you power up.

Negative aspects to the Velo are few — the MIPS chip seemed faster than the Hitachi-powered units, and the batteries

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PINT-SIZED PCS

Neatbooks — the compact alternative?

After the explosion of interest in the US in pocket-sized devices, notebook manufacturers are gearing up for an attack on the PCD market. IBM, Fujitsu, Toshiba, Hitachi and others are busy churning out jewel-sized yet fully capable notebooks running Windows 95 on Pentium chips in packages that weigh under 2kg, and are less than A5 size when the screens are folded down. Although the ability to pack such capability into such tiny packages is impressive, they suffer in comparison to the PCDs on two fronts. First, they have much reduced battery life, and second, they tempt the user into thinking they can be touch-typed on. They can't: the keyboards are simply too small. Nonetheless, a full-blown, PC-compatible machine that is no bigger and only slightly heavier than the Newton, and that runs Windows (but not Windows CE) software is definitely worthy of consideration.

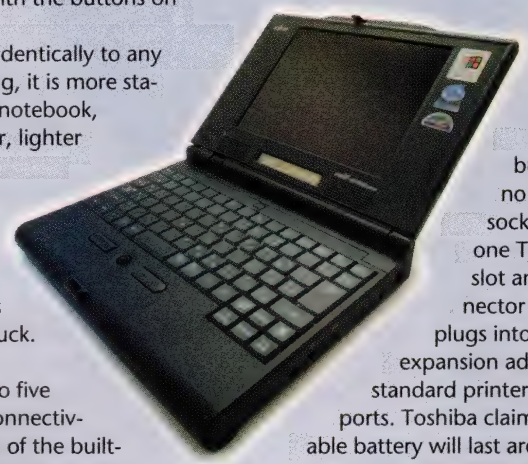
Fujitsu Biblo 5100NC/S

FUJITSU

Rather than a pocket device, this new ultra-subnotebook is better considered as a Filofax replacement. At just over A5 size and a fraction over 1kg with a Pentium 100, 48M of RAM (expandable up to 80M), built-in Sound Blaster, stereo speakers, a dramatically fast 7.3in screen with 9M of VRAM, an 810M hard drive, an external plug-in floppy drive and a built-in 28.8Kbps modem, it's a very powerful replacement too. Expansion is by PC Card slot or via the supplied expansion port. This offers sockets for video, printer, serial, external floppy, mouse and keyboard. A microphone socket and IrDA port are also fitted.

In use the Biblo is notably more practical than the Libretto, with a fair chance of touch typing for small-to-average fingers. The 85-key layout is only an issue because of the Japanese characters and the placement of the Delete key, not because of its size. The extra Kanji keys are there because the Biblo is only made for the Japanese market, and available through personal export only. The screen is about as small as is practical, and despite not being active matrix, is easier to read than the Libretto. The mouse is a match-head type, but on the wrist-rest area with the buttons on either side.

The Biblo works identically to any notebook. If anything, it is more stable than a standard notebook, thanks to the smaller, lighter screen. The power demands of the P100 do sap the small battery, however. Getting more than an hour's work is a matter of luck. An extra battery is claimed to give up to five hours. In terms of connectivity, the combination of the built-in modem, expansion port and PC Card slot means it can be easily linked to existing networks, the Net and external CD-ROMs at the same time. Add to that the minuscule power supply and this item would be worthy of attention from any mobile operator, as long as you can cope with the Japanese instruction manual.

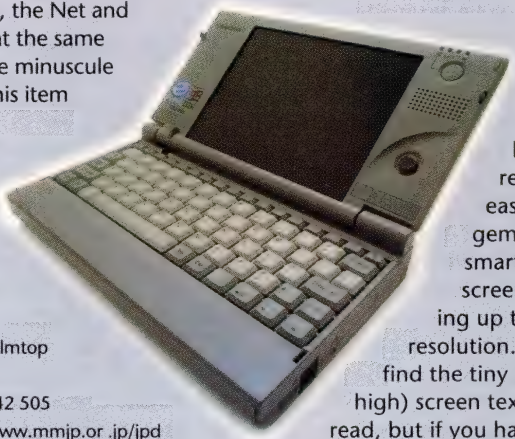


Distributor	Japan Palmtop Direct
Phone	1 800 142 505
Online	http://www.mmjp.or .jp/jpd
Price	$US3,295
In short:	About as small a notebook as you can realistically get. Good specs, very practical, but limited battery life and size.

Toshiba Libretto 50CT

TOSHIBA

Looking more like a grey VHS cassette than a computer, the Libretto is a new breed indeed. Opening up the clamshell lid exposes the backlit 6.1in active matrix colour screen, the absolutely teeny 80-key keyboard, and a stubby, match-head mouse that works with a couple of buttons on the outside of the screen/lid. Inside the case the engineers have somehow managed to squeeze in a Pentium 75, 16M of EDO RAM, a 770M hard drive and a clone Sound Blaster card. As well as a tiny speaker and an external speaker jack — but, surprisingly, no microphone or socket — there is one Type II PC Card slot and a special connector underneath that plugs into the supplied expansion adapter. This offers standard printer, serial and video ports. Toshiba claims the rechargeable battery will last around two hours, or you can double that with a special high-power battery. All up, its weight is a remarkably minuscule 850 grams.



But what is it like to use? In reality, not that easy. The screen is a gem, with some very smart bundled virtual screen software allowing up to 1,024 by 768 resolution. Some users may find the tiny (about 2mm high) screen text a little hard to read, but if you have at least middle-sized fingers, touch typing is out due to the size of the keyboard. Data entry is definitely a two or three-fingered exercise. And because of the size of icons and dialog boxes, clicking needs pinpoint accuracy, which can become tiresome.

Overall, the Libretto is similar to the Nokia Communicator — a wonderful example of what can be done in miniaturisation. But usable in the real world? Not really. It tries to bridge the gap and almost succeeds, but at the price, it is not really a practical pocket tool.

Distributor	Toshiba
Phone	(02) 9887 3322
Online	http://www.toshiba.com
Price	$3,795
In short	Impressive technology, but not really useful.

last well even if the voice/sound recorder is used for long periods. Good software is also included. The only design downer is the brightness control; like the Casio's, it's on the outside of the lid and subject to accidental bumping.

- **Distributor** Philips
- **Phone** (02) 9925 3333
- **Online** http://www.velo1.com
- **Price** Approx $1,450
- **In short** The best CE unit yet. Combines real-world functionality with ready-to-go standard components.

Psion 3c

PSION

Designed before the days of portable GUI OSes, the Psion 3c uses the custom-built EPOC 16 operating system, not Windows CE. This provides a graphical front end for the usual range of portable applications, plus software-driven voice recording, and a scientific calculator.

Like the Velo, the Psion uses a slinky moleskin finish. Combined with its semi-elliptical cross section and light weight, this means it can really be pocketed. The load speed of applets is almost instant, and combined with one-key application load, the Psion beats the pants off Windows CE in usability. Input is purely by keyboard. The keys are concave to make the most of the tight spacing, but data entry is still a two-finger process. The keyboard itself has a couple of quirky dual-purpose special-function keys for you to learn, but to offset this, the Psion comes with excellent built-in, context-sensitive help. Most users should find themselves in familiar enough territory to work within an hour or so.

Opening the clamshell flips down a neat rear support. This gives a very practical screen and keyboard angle. The unit runs lean and mean using a V30 CPU with 1M of RAM, and has no conventional expansion. Instead it uses special solid-state disks (SSDs) which slot into two recesses at either end of the case. These can be either storage RAM or program ROM. A useful range of software is available on this format, but it is not cheap, and not PC Card or CompactFlash-compatible.

The Psion can link to any PC using PsiWin linking software, but this is not supplied, so most data entry will probably be manual. Connections include a custom serial port, and an IrDA port for printing. Although the 480 by 160-pixel mono screen is not backlit, the text and graphics have been carefully designed to be adequately legible in most lights.

- **Distributor** Psitech
- **Phone** (043) 622 014
- **Online** http://www.psion.com
- **Price** $931
- **In short** Excellent standalone unit, but has data exchange and expansion limitations.

US Robotics PalmPilot Professional

US ROBOTICS

The Pilot will be much less familiar to Windows desktop users than the CE machines. It has a tiny custom screen and much less memory. But the reason it has some 50% of the US handheld market is clear: it does the job. The basic functions are those of any personal organiser, but presented in a familiar desktop style. Field and text configuration within applications is absolutely minimal. Consequently, the majority of users will simply switch on and enter contacts, memos, events and so on up to 2,500 addresses, 750 to-dos and memos and 100 email messages. The latest versions also include a handy expense utility and a slightly clearer backlit screen.

The Pilot's supremacy is not only due to its very simple and workable Graffiti text-recognition software which allows rapid data entry with no keyboard. Nor is it merely thanks to the newly enabled TCP/IP compatibility which lets you collect email while on the road. It's really the product of its HotSync facility. Compared to Windows CE, this is a lightning bolt.

Simply slot the Pilot into its desk stand, press a single button, and everything in the unit itself and the complementary DeskTop PIM updates in a flash, gives you a log of what has happened, and dumps your expense report into Excel. Both Pilot and desktop will now contain the latest data from both, and you can be secure in the knowledge that flat batteries won't devastate your contact list.

Battery life is also very good, with a month as an absolute minimum — even with backlight mania. The innovative

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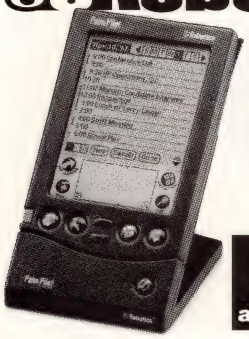

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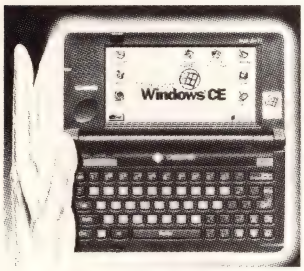
HEWLETT PACKARD $1395



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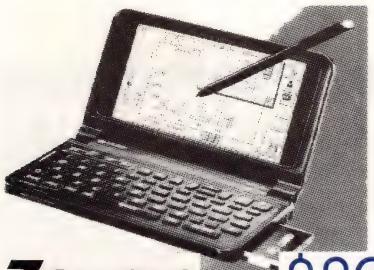

Zaurus ZR5800 $899 With bonus Fax/Modem

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Graffiti writing-recognition system works surprisingly well with a minimum of familiarisation, performing a claimed 30 words per minute. The latest add-ons are a host of downloadable applications, a snap-on mini-modem and even wireless comms units. You can use it with a Mac, too.

Given its size, cost, speed and real functions, the Pilot must still be favourite to win the pocket market.

- **Distributor** US Robotics
- **Phone** 1800 622 778
- **Online** http://www.usr.com.au
- **Price** Personal $499; Professional $599
- **In short** Small, power miserly, fast and very convenient. Pocket-wise, it's the business.

DIGITAL DATA DUMPING

Beating the export blues

While the concepts of 'PDA' and 'failure' are inextricably linked in the minds of many individuals, sales of ultraportable PCs, pocket computers and other midget contributors to the technology pantheon have in fact been rising steadily over the past few years. According to market research firm Dataquest, 1.6 million handheld units were sold in 1996, a 29% increase on the previous year. While that's a drop in the ocean compared to PC sales overall — for instance, Dataquest estimates that PC shipments worldwide during the second quarter of 1997 reached 18 million — it still represents a healthy and growing market, with 23% growth predicted for this year.

Healthy and growing markets can lead to unexpected problems, however. As pocket computing devices become more functional and standards-based, users of older systems with proprietary architectures may wish to upgrade (there is virtually no market growth in proprietary systems, despite the expansion of the handheld market as a whole). This, however, presents a challenge: how can data be moved from one system to another?

Older organisers may offer little choice except laboriously retyping relevant information. Systems which provide some kind of interface to a desktop PC can normally have their files exported in a text-only format, but this can prove tedious and time-consuming to re-import.

Spotting a potential gap in the software market, US firm Puma Technologies in July announced IntelliMigrate, a series of products designed to simplify the task of exporting data from older PDAs and organisers (which it quaintly describes as "first generation" systems). "As with many consumer-oriented electronics products, users are often eager to improve performance and take advantage of the latest technology," said Puma CEO Brad Rowe.

IntelliMigrate runs on the user's desktop PC, importing information from an organiser connected to the system. Once imported, it can automatically be exported in a variety of formats. At the time of going to press, only a Windows CE version was on offer, enabling direct transfer of data into that operating system's calendar, contacts and tasks applications. The product supports 28 organisers from Sharp, 40 from Casio, and three from Hewlett-Packard. Controls on importing allow the selection of specific records by date, and field matching ensures that data is imported correctly.

Puma also plans to release versions to allow data export from the Sharp SE-500 and the US Robotics Pilot. The product can be purchased directly from Puma's Web site (http://www.pumatech.com) for $US39.95, and will be launched locally later this year.

Angus Kidman

Specifications: Pocket computers

Manufacturer	Apple	Casio	Hewlett-Packard	Hitachi	Philips	Psion	US Robotics
Model	Newton MessagePad 2000	Cassiopeia	320LX	HPW-10	Velo 1	Psion 3c	PalmPilot Professional
Distributor	Apple	Mobex	ACCO	Hitachi	Philips	PsiTech	US Robotics
Phone	(02) 9452 8100	(02) 9370 9100	(03) 9544 4000	(02) 9888 4100	(02) 9925 3333	(043) 622 014	1800 622 778
Price	$1,699	$899, $999	$1,395	Not available	Approx $1,450	$931	$599
OS	Newton OS	Windows CE	Windows CE	Windows CE	Windows CE	EPOC 16	Pilot OS
Screen	480 by 320 backlit	480 by 240 backlit	640 by 240 backlit	480 by 240 backlit	480 by 240 backlit	480 by 160 LCD	Backlit LCD
Input	Stylus & touchscreen	Keyboard	Keyboard	Keyboard	Keyboard	Keyboard	Stylus & touchscreen
RAM	5M	2M, 4M	4M	2M, 4M	2M, 4M	1M	Pro 1M, Personal 512K
CPU	SA 110	Hitachi SH3	Hitachi SH3	Hitachi SH3	MIPS R3910	V30H	N/A
Card/slots	2 x PC Card Type II	PC Card Type II	PC Card Type II	PC Card Type II	No	SSDisk x 2	No
Expansion	No	Custom	Yes, flash, custom	Custom	Yes, flash, custom	Custom	No
Max RAM	5M + card	4M + card	4M + card	4M + card	12M + card	1M + 8M SSD	1M
Batteries	4 x AA	2 x AA	2 x AA	2 x AA	2 x AA	2 x AA	2 x AA
Batt life	24 hours	20 hours	15 hours	24 hours	15 hours	80 hours	2 months
AC supply	Yes	No	Yes	Yes	Yes	No	No
Comms	LocalTalk, serial, IrDA	Win CE serial, IrDA	Win CE serial, IrDA	Win CE serial, IrDA	Win CE serial, IrDA, modem	Custom serial, IrDA	HotSync
Applications	Sound rec, browser	Email, fax, financial	bFax Pro	PIM	Voice, database, email	Sound rec, calculator	Expenses
Size	119 by 210 by 28	26.5 by 175 by 92	28 by 182 by 95	25.8 by 168 by 98	30 by 173 by 96	22 by 165 by 85	120 by 80 by 17
Weight	660g	380g	355g	350g	355g	275g	162g
Online	http://www.info.apple.com/newton	http://www.casio.com	http://www.hp.com	http://www.hitachi-ce.com	http://www.velo1.com	http://www.psion.com	http://www.usr.com.au

CULTIVATING THE TECHNOLOGY BACKYARD

KEEPING UP WITH THE JONESES TAKES ON NEW MEANING IN THIS GLOBAL INFORMATION AGE, WHERE YOUR TECHNOLOGY NEIGHBOURS, PARTNERS AND COMPETITORS COULD BE THOUSANDS OF KILOMETRES AWAY.

Many nations were left behind in the industrial, computer and information revolutions, but the chase is on, with opportunities to leapfrog straight to the best technology and sermons on the need to get wired, inspiring huge change. Just where do we stand, and what do the technologically undeveloped need to do to get on the IT gravy train — if they can afford it?

Perhaps the question should be, can these nations afford not to?

History has provided evidence to suggest technology supplies the means to get ahead economically. The world's most 'successful' (read wealthy) economies and companies are wired and tapping into the Information Age. It is all about using IT as a basic infrastructure, according to one of the richest men in the world, who lives and set up his company in one of the wealthiest and most powerful nations in the world, Bill Gates.

"[Information technology] is as important to a country's development in the Information Age as electricity has been in the 20th century," said Gates in a Confederation of Indian Industry speech in New Delhi earlier this year. "Properly deployed, IT increases jobs and helps the economy grow. In the US the fastest growing industry, and the greatest job creator, for the last 10 years has been the computer industry. Businesses in other industries that have adopted advanced technologies, along with solid training, have seen productivity improvements and a greater ability to compete."

And this has proved a great example and impetus for those countries that have achieved 'emerging nation' status, but what about those that haven't even reached the starting line yet? More than half the world's population has never even made a phone call. In the least developed countries (LDCs), there is just one phone for every 350 people. In all of the 48 LDCs, the number of phones is just 1% of the total number of phones in the whole of the US .

According to the United Nations, the World Bank and many non-government organisations, it is imperative that developing nations receive the same access to information via technology as the economically developed world, or they will become increasingly marginalised. Others believe the basic necessi-

BY SELINA MITCHELL

Starting from scratch

Africa: The priority

So far removed is Africa from the Information Age, that in terms of participation, it is falling behind all other developing regions. According to International Telecommunication Union (ITU) statistics, while in the US there are 58 phone lines per 100 people, in Africa there is just one per 100. In Ghana, one village may share a radio, or instead rely on a 'gong gong' for communication. In rural Choma, Zambia, there is no electricity or phone connection within in a radius of 50km.

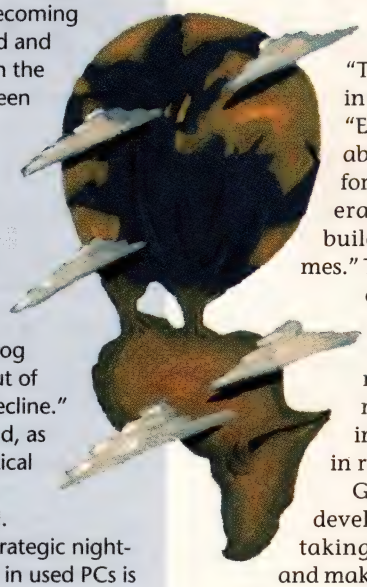
"If Africa is to catch up, it needs to begin matching the growth rates of other developing regions, that is, two to three times higher than its current growth rate," said Dr Pekka Tarjanne, ITU secretary general, in a paper presented in Geneva late last year. "And this falling behind is not restricted to the fixed-link network. There are, for example, more mobile telephones in Thailand than in the entire African continent. In the area of Internet penetration Africa is doing better, but that is almost solely due to the high level of Internet usage in South Africa."

There are massive disparities in telecommunications development, and between the information rich and information poor within Africa. Sub-Saharan Africa is the least connected part of the world. Over the last decade, the number of telephone lines per 100 inhabitants doubled in Northern Africa. In South Africa, teledensity increased by two percentage points, and is now approaching 10; however, in Sub-Saharan Africa teledensity has stagnated. Also, waiting times for the installation of a phone line stands at five years in the latter region.

For these reasons, Africa has become the ITU's telecommunications development priority. Conferences have been held, projects set up and a UN Special New initiative organised to wire Africa and get its nations involved in supplying universal access to basic telecommunications services. One such scheme is CABECA, a project to promote the computer networking of Africa (this service was created to benefit researchers, development professionals and business persons, rather than your average African, to aid collaboration.) Charges for phone calls and Internet access in Africa are generally higher than everywhere else, and the cost of a local phone call means the service is beyond the reach of all but the elite, anyway.

The World Bank, too, has been involved in promoting 'progress' in Africa, not only to aid the locals directly, but also to aid its work in the region. Electronic networking is a useful tool for the WB to advance its objectives, activities and developments, said a World Bank paper, *Increasing Internet Connectivity in Sub-Saharan Africa: Issues, Options and World Bank Group Role.*

"In an increasingly knowledge-based economy, information is becoming at least as important as land and physical capital," it said. "In the future the distinction between developed and non-developed countries will be joined by distinctions between fast countries and slow countries, networked nations and isolated ones. The information revolution offers Africa a dramatic opportunity to leapfrog into the future, breaking out of decades of stagnation or decline."



But it will take a lot of aid, as well as changes to the political instability in many regions, before this can be achieved. Even acts of goodwill are strategic nightmares; the cost of shipping in used PCs is often more than the cost of buying new ones, according to aid workers.

Microsoft CEO Bill Gates said the Internet is poised to open up Africa to the world. On a business trip to South Africa earlier this year, he declared Africa could throw off its image as a technology-backward country by adapting quickly to the Internet. "The Internet is the single most important tool that will open up Africa to the rest of the world," Gates said at a press conference when he announced the opening of a South African office.

He admitted there was a long way to go in Africa before Microsoft would have a large market. "Technology is not a choice . . . the individual level will take a long, long time, but because we are patient and take a long-term view, we were willing to come in now and build up that infrastructure."

Does anyone want to donate any PCs — and the cost of shipping them?

ties of life, such as access to food, shelter and education, should be met before developing nations start borrowing money to acquire technology. However, most agree that electricity and phone lines are essential — without them, the most basic of services can not be provided, let alone the more advanced technologies.

Emerging with technology

Many developing countries in Asia that have progressed to emerging nation status have reached this level via a similar route, and technology has played a vital role, said Mike Withford, director of Stratos, a marketing and strategy consultancy focused on Asia.

Access to electricity is a priority, as you need power to drive most technologies. "There is massive investment in this area," said Withford. "Energy usage is growing by about 15% per year in Asia, for example, with most generated privately through builder/owner-operated schemes." The next step is to install an adequate phone system, initially in metropolitan regions, and then in rural areas. While many nations have achieved this in capital cities, 'teledensity' in rural areas is very low.

Growth rates are built up in developing countries through taking an established product and making a low-cost version, taking advantage of cheap labour costs and the lack of marketing or R&D expenses, said Withford. Economic and political barriers need to be cast aside to let foreign investment in, he said. Once the economy starts to grow, however, labour, technology acquisition and education costs increase and nations lose their 'cheap producer' status, and their growth margins. So the money made from the initial schemes must then be pushed into other areas that allow value-adding and ownership of technology and knowledge.

Many emerging economy nations are seeing the technology light, and moving into new fields as well as vamping up the education of present and future workers. Malaysia's Multimedia Super Corridor is one example (see 'Malaysia's super saviour' on page 96), as are China's Golden Projects (see 'China: Golden opportunities' on page 100). Thailand is at present feeling the pinch of not moving fast enough to a

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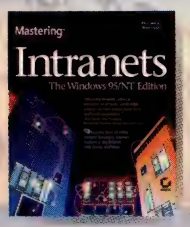

Mastering Intranets The Windows 95/NT Edition
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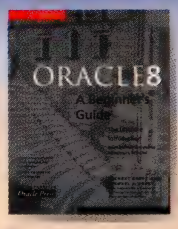

Oracle8: A Beginner's Guide
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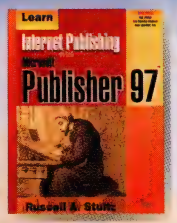

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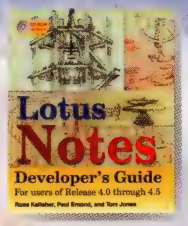

Lotus Notes Developer's Guide
Rose Kelleher, Paul Edmond & Tom Jones
Practical instructions and advice for Lotus Notes developers. Topics range from making Notes applications available on the Web; using Lotus-Script, manipulating OLE objects and using ODBC for database information exchange.
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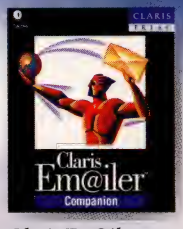

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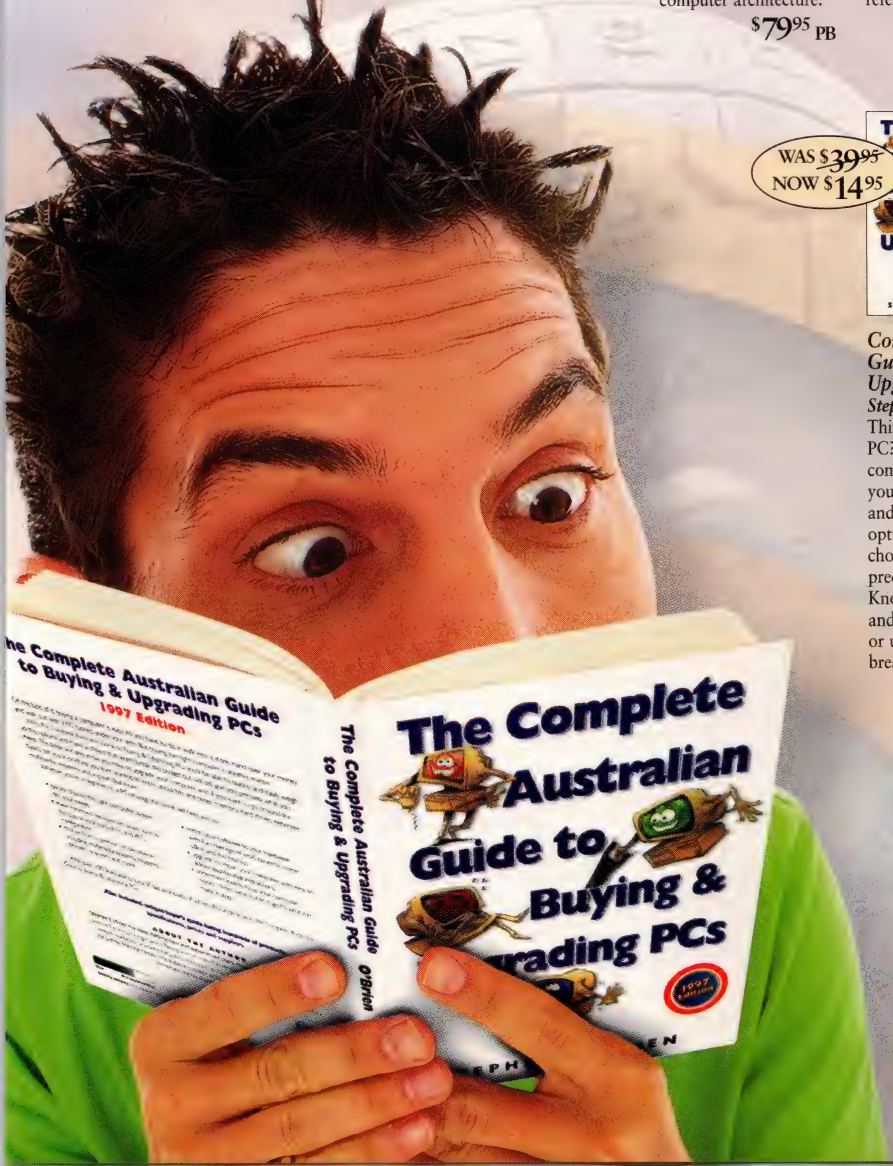

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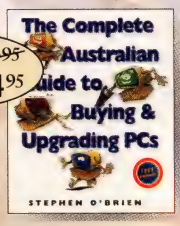

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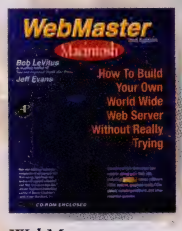

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South-East Asian tiger

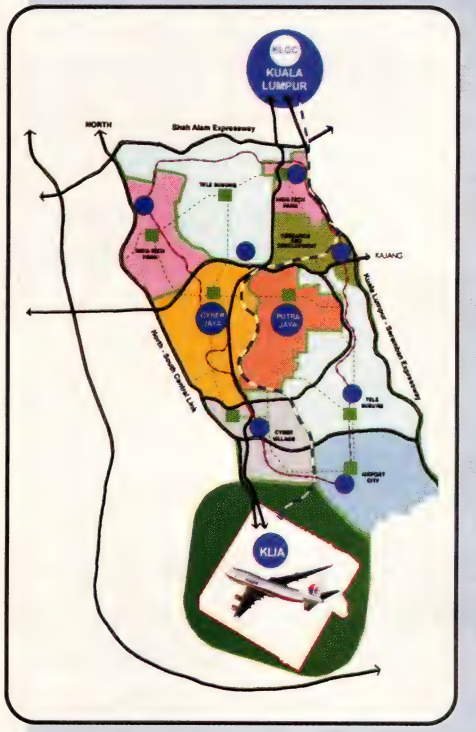
Malaysia's super saviour

Malaysia moved from a developing nation to an emerging economy by emulating Japan's economic strategies. Now it is looking further east, to California, for the next stage of its development, the leapfrog into the information age. The Malaysian government is attempting to transform a stretch of land the size of Singapore on the Malaysian Peninsula into the next Silicon Valley.

Unlike the Valley, however, which evolved over more than 30 years of somewhat accidental events, the Multimedia Super Corridor (MSC) will be a directed, accelerated venture, said a government official; the plan is to have it as successful and productive as the Valley within 10 years.

The aim is to quickly create an environment that fosters a highly competitive, world-class cluster of local and international IT companies, said Mohamed Arif Nun, executive director of the Multimedia Development Corporation (MDC), the agency set up to govern the corridor. "It will be a catalyst for collaboration between all the best minds."

"We have planned the timing and the impact. The 15 by 50km area will combine state-of-the-art buildings, and the best physical infrastructure, software infrastructure, cyber laws, and university." And, of course, human resources.



The plantations south of Kuala Lumpur will be replaced with a new administrative capital, Putrajaya, and a 7,000ha intelligent city, Cyberjaya. The Malaysian prime minister, Dr Mahathir bin Mohamad, will move his offices and those of the national government to Putrajaya in September next year. This bureaucratic centre will be a working model that showcases the multimedia technologies needed to create a paperless administration. US companies, such as IBM, are clamouring to participate.

Described as the nucleus of the MSC, Cyberjaya will house a Multimedia University, telemedicine hospital, accommodation, parks, and an international school. All will be connected via a high-capacity global telecommunications and logistics infrastructure built on a 2.5G to 10G digital optical fibre network. The university will, like Stanmore in California, be an intellectual hub, surrounded by research labs and companies attracted to the region by tax incentives and relaxed work visa requirements.

Development within the MSC will focus on seven applications: electronic government, telemedicine, smart schools, a national multipurpose card, R&D clusters, worldwide manufacturing webs, and borderless marketing centres.

The plan is to use the 'plug and play', country within a country as a test-bed for implementation in the rest of the nation. "We feel this is the most efficient way to update Malaysia — to do it in a controlled area and then clone it out to other parts of the country, and connect it to the rest of the world," said Arif.

Riding this technology gravy train has its risks. Costs for the MSC are sketchy, but run into the tens of billions of dollars. It is estimated that the telecommunications infrastructure and paperless office will cost at least $2 billion each, although Arif insists these are joint ventures, so all expenses will not be incurred by the government. The concentration on multimedia, and the seven applications, also has its risks, as returns are not assured. Malaysia's reputation as a nuisance place to live and work could also prove a deterrent for investors — there is a shortage of knowledge workers; and traffic jams, bureaucratic bottlenecks, power blackouts, faulty phone lines and heavy construction are all reported. The MSC is not only a technical but also a social experiment. The traditional, predominantly Islamic society will be open to Westerners and Western ideas.

But Arif said it was really like jumping off a cliff before you were pushed, in order to fly. "This is not risky at all, but something we have to do, because of the competition we are facing from countries with much cheaper labour costs than us," he said. "We've got no choice. We have got to go up-market, and we have to do it while we are ahead. We have to do something to get to the next stage of development.

The scheme has some impressive backing, however. A panel of advisors has been created, with members such as the chief executives of IBM, Microsoft, Sun Microsystems, Netscape and Oracle. The first 10 to 20 pilots will start implementation by the end of next year, taking up 750ha of Cyberjaya. There are 75 companies in the pipeline for MDC status so far, and these include big names of the ilk of Microsoft, Lotus and Sun, according to Arif, who was not willing to name names.

Arif was not concerned by Malaysia's neighbours and their efforts to create similar technology parks and wired communities. "We are not thinking in terms of competition. We are thinking more long term, more holistically. The MSC will be integrated into a global community, just one of the smart centres around the world."

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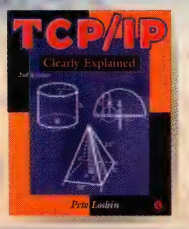

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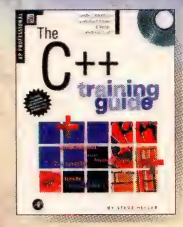

The C++ Training Guide
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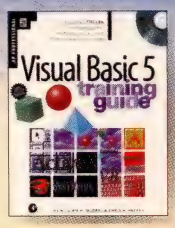

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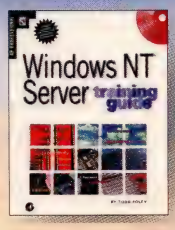

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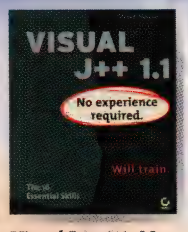

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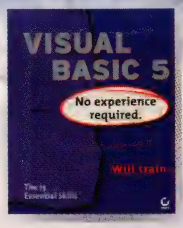

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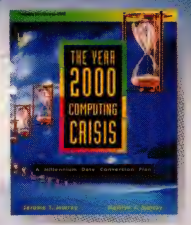

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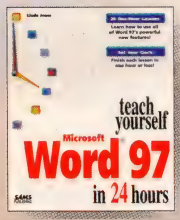

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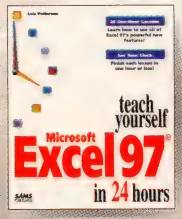

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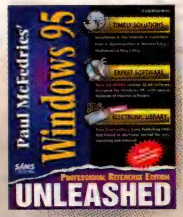

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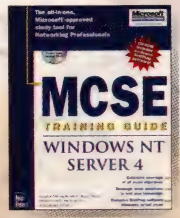

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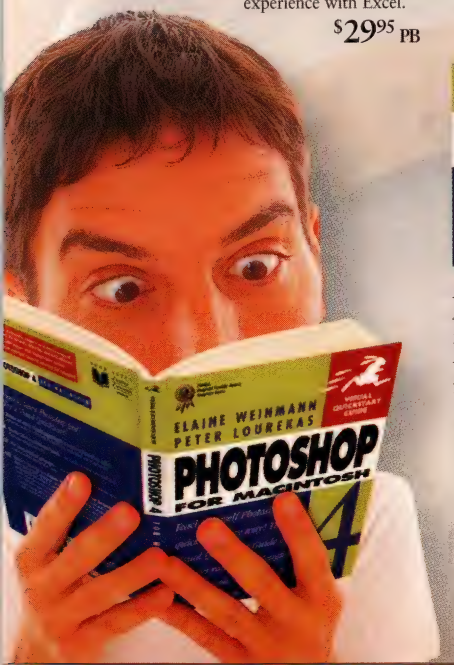

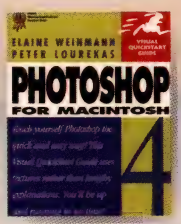

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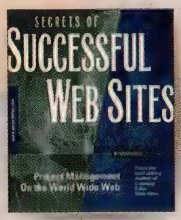

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new economic model (see 'Thailand: The tiger needs a technology feed' on page 105).

Many countries in the Asia-Pacific region are concentrating on improving their education systems, installing computers and creating IT universities. In the meantime, those with the resources are sending their children overseas to be educated. For example, foreign students contributed almost $3 billion to the Australian economy last year. The majority of those educated overseas return to their place of birth and add significantly to the pool of resources that an emerging or developing nation requires. Once universities are established in their own nations, such students will not need to study overseas, unless countries like Australia offer incentives and improve their own systems, said Withford.

Australia, like all other nations, has the opportunity to use the Internet and technology to maximise its economic advantage. Whether we will be able to keep up with our neighbours is another matter. Our IT exports dropped from $1 billion in 1995 to $800 million last year. According to a report into the competitiveness of the Australian information industry, the federal government must make extensive, catalytic and immediate policy changes to ensure Australia becomes a serious global player in the information industries arena, rather than a spectator operating on the periphery of the main game (see *APC* June page 19). The federal government has since announced that it plans to develop an IT policy blueprint (seven reports have already been completed on the subject in the past three years), and Prime Minister John Howard returned from a US trip with a view that IT could be the answer to employment generation in the nation. Recently, however, the federal government scrapped the computer bounty, eliminating about $50 million per year in industry assistance.

Regional overview

Australia's reputation as a technology-hungry nation, with mobile phones on every hip and the largest number of PCs per capita in households outside the US, is under threat; other countries in the Asia-Pacific region are catching up to us.

Research firm IDC tracks figures on the number of PCs bought in 14 Asia-Pacific countries and, surprisingly, Australia and New Zealand are the slowest growing markets. "Even the Philippines is ahead of us," said Graham Penn, general manager of IDC New Zealand. This year, Korea will ship [in] more PCs than Australia, he added.

Software sales growth in the Asia-Pacific region has begun to outpace the sales growth in North America, according to the US Software Publishers Association (SPA). And while Australia is still a large market, others are gaining in significance. Sales of US-published software applications for PCs reached $US1.4 billion in the region last year. This figure is distorted by the enormous sales activity in Japan, where about 70% of software ($US1 billion worth) was headed, but other strong markets have emerged, according to the SPA, including Korea and Malaysia.

While in some respect this is a reflection of the huge populations of these countries compared to Australia and New Zealand, it also signifies moves in many of these countries to jump onto the technology bandwagon.

Penn stressed that it is unrepresentative to generalise about Asian markets, because their IT markets and needs are all incredibly different. While Japan dominates the consumer IT market in the region, countries such as Cambodia and Myanma (Burma) can't supply the basic necessities of life.

"Japan creates 70% of all IT revenue in the region," said Penn. "If you draw a chart, Japan dominates everything; all else diminishes in significance. Sometimes you need to draw a graph without Japan to get an idea of what is happening elsewhere."

Singapore and Hong Kong also have their own, seriously developed IT infrastructure and market characteristics, although questions remain over the future of finance centre Hong Kong after its handback to China. Already the parent of high-tech manufacturing in the region, Singapore is attempting to build a totally wired community, said Penn, and Malaysia is embarking on a similar project, where it wants to create product for the rest of the world and use the technology locally to become a smart country.

India, with a population of almost 1 billion, has a huge IT market, but it is still somewhat restricted to US vendors in partnerships with Indian companies. International companies need to create partnerships with local companies to accomodate the government's 'India for Indians' policy.

China, too, has a large market that is growing steadily and is already the second-largest in the region, according to Penn. Korea is also moving ahead, with more PCs sold there in 1996 than were sold in Australia. Indonesia, on the other hand, although it is the fourth most populated country in the world and has a middle class the size of Australia's entire population, remains a relatively undeveloped nation. Its PC shipments were equal to only one-third of the number of PCs shipped in Australia last year. "There is a huge disparity of wealth," said Withford. "While many people wouldn't earn more than $500 a year, there are also many millionaires," he said. Bandung (half a day from Jakarta on the train) is attempting to become the IT R&D, manufacturing and education centre of Indonesia.

Two years ago Thailand had a rapidly developing and growing economy, but now it is going through difficult economic times and the IT industry is in a holding pattern, said Penn. "We definitely can't assume it will grow in the short term."

Money, said Penn, is a crucial factor in determining the IT progress of any country. There is a direct correlation, he said, between high GDP and a strong local IT infrastructure. Vietnam is slightly ahead of its neighbours, but countries such as Cambodia, Laos, Myanmar (Burma) and Nepal would not be technology consumers for 10 years as there was no spending power, according to Penn. This creates a vicious circle, he said, as they then would have no means of getting ahead and no means to create the means.

PC shipments in 1996 Source: IDC

Australia	1,393,600
Hong Kong	342,500
India	447,100
Indonesia	420,800
Japan	8,099,200
Korea	1,973,900
Malaysia	328,200
New Zealand	195,700
Philippines	187,750
PR China	2,108,200
Singapore	306,200
Taiwan	525,000
Thailand	321,800

*Shipments are for PCs sold and for use within country.

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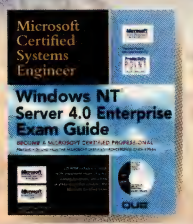

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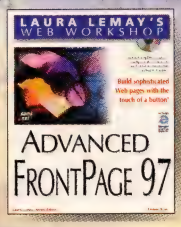

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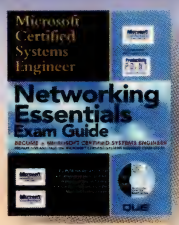

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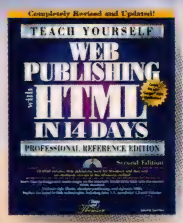

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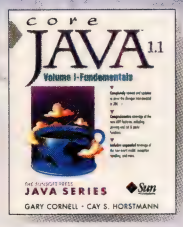

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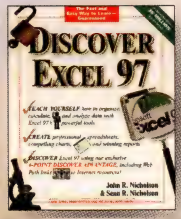

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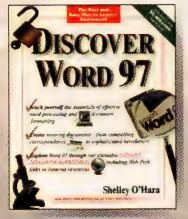

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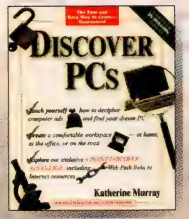

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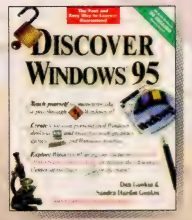

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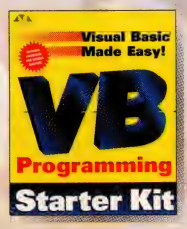

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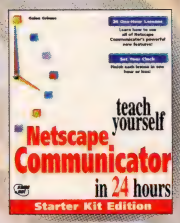

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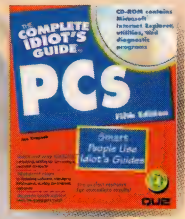

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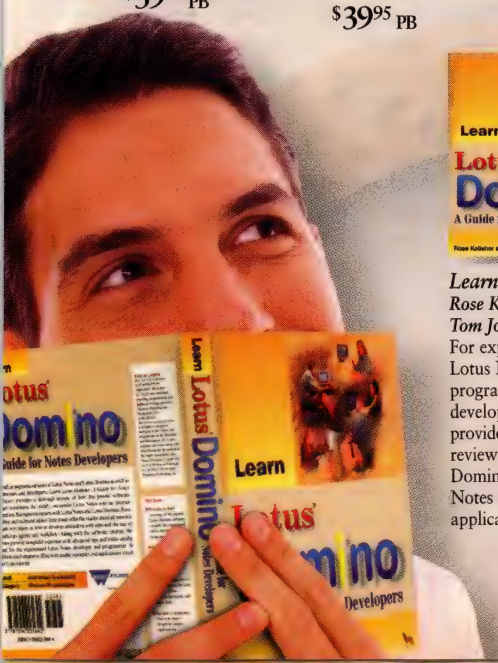

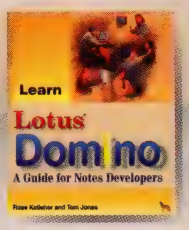

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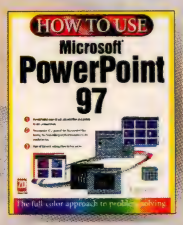

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The big backyard

China: Golden opportunities

Besides being the world's most populous country, and one of the globe's fastest growing economies, China is also the IT market to watch. With 2.1 million PCs sold in 1996, it is second only to Japan in the Asia-Pacific, according to IDC. By 2000, the number of PCs sold is expected to reach 6.1 million. The market is doubling in size every year, and China's IT spending is expected to increase by 24% annually.

Both urban families and the government see IT as a top purchasing priority. For the government it is a pillar industry, integral to increasing China's world economic standing. Not surprisingly, China has become a focus market for many foreign firms, as present markets become saturated. Despite government and cultural hurdles, many are eager to enter the Chinese market.

And China's Golden Projects high technology agenda provides many opportunities. Through Golden Projects, the government plans to create its own 'web' of information (Golden Bridge), smart card banking system for 300 million people (Golden Card), computerised tax system (Golden Tax), and more.

But it ain't that simple. China's market is difficult to enter, with tight government regulations, tax restrictions, and a tight-knit, wary network of distributors, as well as a continuing software piracy problem. It is rumoured that Compaq lost $US32 million to a Chinese distributor in 1995, when it shipped PCs that were never paid for, and there were also comments that Compaq had not succeeded in the market because it could not establish the necessary relationships with local distributors. The company announced it would restructure its offices in the region, saying a direct presence in the area was needed.

Questions also remain regarding the re-integration of Hong Kong with the mainland, and the effect on both China's economic power and Hong Kong's position as a trade and finance centre, despite the 'one nation, two systems' approach. How to merge the two policies on encryption is one question, with China restricting the use of encryption, and Hong Kong liberally allowing its use.

And then there is the sticky problem of dealing with a nation whose human rights record is questionable. How much contribution and activity by foreign firms is acceptable in a country which restricts Internet access to Web sites that criticise Chinese activity in Tibet; asks Internet users to register with the police; and crushes revolts against dissidents?

Some have suggested a code of conduct to ensure that none of the industry and technology introduced contributes to the Chinese government tightening its grip on power — a tall order.

Information is bliss

While Gates *et al* have a vested interest in keeping IT sales expanding, others are promoting similar pro-technology philosophies. Unfortunately, much of the advice appears to focus on which IT products to take up, ignoring the fact that many countries don't even have the electricity to run equipment, let alone the money to pay for it (see 'Africa: The priority' on page 94).

The UN Development Programme (UNDP) has calculated that the number of people living in absolute poverty is increasing by almost 25 million per year. About 1.3 billion people (one quarter of the world's population) are trying to survive on less than a dollar a day. Nearly a billion people are illiterate; over 1 billion lack access to safe water; 840 million go hungry or face food shortages; and one-third of people in the poorest countries (mostly in sub-Saharan Africa and South Asia) won't live to be 40 years old. The UNDP's Index of Human Development this year showed that 30 countries were regressing rather than progressing in terms of human development.

So just how will technology help these people? How on earth will their governments afford it? How do you make information an agent of change and a tool of prosperity in areas lacking the basic necessities of life? These questions were discussed at length at the UN/World Bank Global Knowledge 97 conference in Toronto, Canada (http://www.globalknowledge.org/). For the UN, as well as the World Bank, the answer to the extreme inequalities in the world can be found in access to information.

The UNDP believes telecommunications infrastructure is at the root of information poverty: "Telephone access and connectivity will be key for participation in the global information society and markets and thus for future development and wealth creation," said the UNDP Technology Revolution Study (http://www.undp.org/undp/comm). "Indeed, the levels of economic development and telecommunications development are closely correlated. The quality of communications infrastructure and connectivity has already become a major competitive factor for attracting foreign direct investment in sectors other than telecommunications."

UN Secretary-General Kofi Annan outlined his belief in the power of information and its impact on development at the Global Knowledge 97 conference. "Knowledge is power, information is liberating, education is the premise of progress, in every society, in every family," he said "It is ignorance, not knowledge, that leads some to advocate tyranny over democracy. It is ignorance, not knowledge, that makes some think that human misery is inevitable."

Annan outlined the means to foster an enabling environment for development. These included promoting greater, freer and fairer access to information for developing countries through infrastructure improvement and technological advances; advancing the liberalisation of government control and censorship; fostering environments of growth and communication between developed and developing countries; welcoming foreign investment and making that investment an agent for knowledge; and providing pilot projects in fields such as interactive long-distance learning and telemedicine.

Access to information and communications technologies (ICTs) is crucial as it

STILL LOST

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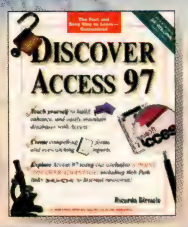

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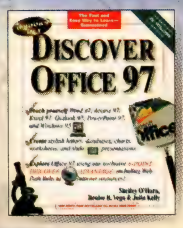

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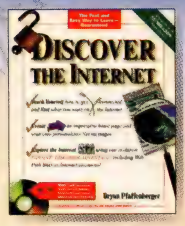

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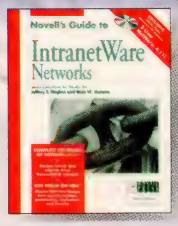

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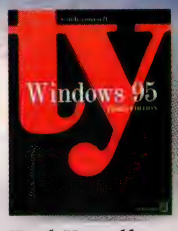

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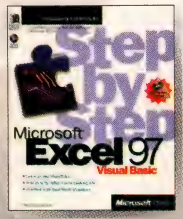

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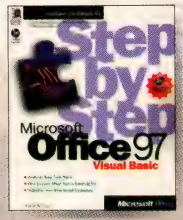

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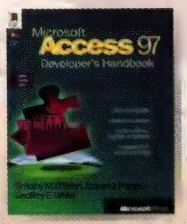

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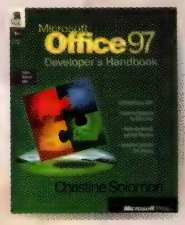

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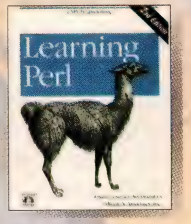

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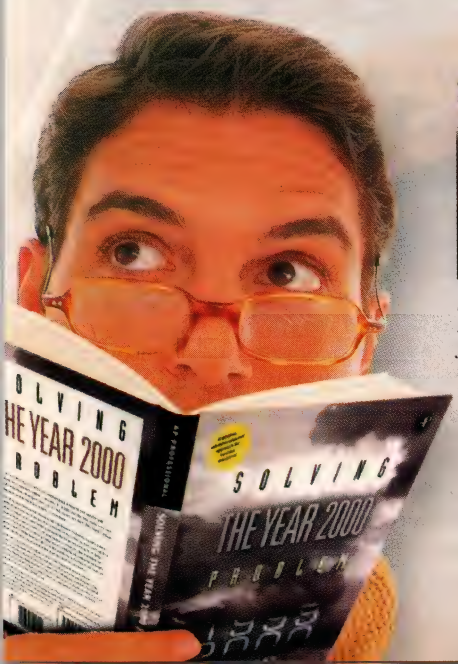

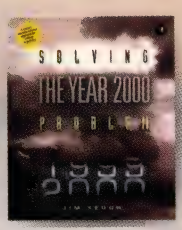

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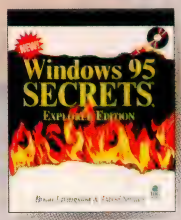

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provides three important opportunities, said Janice Brodman from the Education Development Center, an education and training non-government organisation. It improves access to information, packages useful information supplied from the developing nations, and supports collaboration. ICT also posed threats, she said: loss of employment, loss of culture, and loss of political sovereignty.

The answers were not found at the conference; in particular, there was no real consensus on which should be a greater priority — providing basic health and education needs or ICT. Many aid workers pointed out the need for the donor community to provide more funding and low-cost technology alternatives, as IT was not a priority for spending and investing for local governments. This was not because these governments didn't see it as important, but because such things as clean water and utilities infrastructure needed immediate investment attention.

The push for more

While the bad news is that developing nations are finding it difficult to acquire the technology needed to join the information revolution, there are advantages to starting late. Such nations can bypass the mistakes made by the technologically advanced and leapfrog to the best solutions, said Computer Associates chairperson and CEO Charles Wang, who spoke at a UN Connectivity conference in New York in June.

While the bad news is that developing nations are finding it difficult to acquire the technology needed to join the information revolution, there are advantages to starting late.

Wang warned countries not to waste time reinventing the wheel. "There is a great debate going on in China right now about whether or not China should develop its own operating system," he said. "I believe they should not. They shouldn't because there is already overwhelming support today for many existing and proven operating systems. Developing a new one means developing everything from scratch — including all the new applications to run on it. Emerging technology nations cannot afford not to take advantage of the excellent technology that already exists."

Unfortunately, this argument does not take into account the varied cultures and needs of nations around the world. Do they all want to work the same way, using the already popular software created by and for the American market? This counterargument, of course, does not benefit the established players.

Maturing US businesses that wanted to maintain or expand existing growth rates have, in the past, expanded their services into regional markets in other parts of the world. Ford, McDonald's, Coca-Cola and Levi Strauss are prime examples of US culture becoming an integral part of other cultures; the shopping malls being constructed in emerging nations are full of US-based takeaways, clothes outlets and more. Now it is the turn of the IT companies, which have been given a helping hand by the global, borderless nature of the Internet and the eagerness of countries to adapt to technology in an effort to improve their social and economic situations.

Both Bill Gates and Intel CEO Andy Grove went to Europe earlier this year for the World Economic Forum, and warned that a technology deficit in Europe was threatening its global competitiveness. The region has to wake up to the advantages of computer networks, or it will start to lag behind emerging markets, business and political leaders were told by Grove in his plenary speech. Similar speeches have been made throughout the world, the most recent by Michael Dell, founder and chairperson of Dell Computer at Global Knowledge 97, where he highlighted the need for technology to aid development.

Conditions have been sweetened by the World Trade Organisation-inspired deal to scrap tariffs in the IT trade by 2000. About 40 countries agreed to cut tariffs in stages in five product areas: computers, telecommunications, semiconductors, software and scientific instruments, which will mean cheaper products for consumers and more sales and savings for manufacturers, according to WTO chief Renato Ruggiero. (Present tariffs in India, for example, are as high as 52%.)

Wherever they can, firms are moving in and creating market opportunities for themselves in relatively unestablished and untapped nations. India is a prime example: if prodded to get the telecommunications and IT infrastructure right, it could use its workforce to great advantage, according to outsiders (aka foreign computer giants). India is by no means an established IT market, and for now the majority of the huge population has no money to buy a PC, but that is expected to change. India's federal government has asked state governments to use 1% of their budgets for 1997-98 on IT.

India is by no means an established IT market, and for now the majority of the huge population has no money to buy a PC, but that is expected to change.

Gates has described India as a potential software superpower, with "well-respected" technology centres in Bangalore, Pune and other places (India already has soaring annual software exports — $US500 million worth in 1994-95 alone). And he wants to help it on its way, aiding in establishing the country's global pool of talent and resources. He is aiming to increase the number of Microsoft Certified Professionals tenfold by the end of the year (they presently number 1,000). While in India, Gates launched the University Advanced Technology Labs Program in five universities. Microsoft will invest almost $US1 million to set up labs to teach Microsoft software skills, and a Microsoft India Initiative will accelerate the use of the Internet in the country.

"To be a leader in the digital economy of the 21st century, India must invest in basic infrastructure, education and information technology," said Gates in a speech to the Confederation of Indian Industry. "These are the tools which will drive the country into the future and make India an economic and software superpower."

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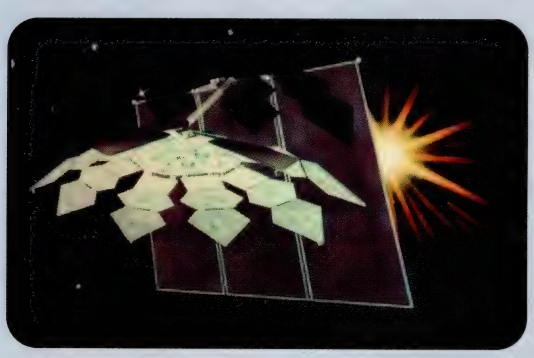
Bouncing off the satellites

In the air tonight

Are satellite telecommunications the dream solution to Internet access in geographically isolated or infrastructure-barren regions, or is the idea a starry-eyed, money-losing nightmare? While most big cities in the US, Europe and Asia-Pacific are wired for heavy Internet traffic, most of the world is not — yet.

As information access becomes an increasingly essential factor for economic growth, education, health and public information, companies are planning to supply options for those areas yet to be serviced by terrestrial telecommunications systems. Since Teledesic's announcement that it would set up a $US9 billion system of low-orbiting satellites to provide a global broadband 'Internet-in-the-sky' by 2002, two other companies have announced plans for similar services.



None of the services will be operational before 2001, and none of the visions are anywhere near reaching reality. However, if any of them do succeed, they may provide the solutions to both the bandwidth problem and the lack of services available to information-poor areas.

Representatives of the Teledesic venture have been the most vocal. The scheme involves a constellation of several hundred low Earth orbiting satellites. Unlike geostationary satellites, LEOs orbit much closer to the Earth, which, according to Teledesic statements, eliminates the problem of long signal delays and enables the use of small, low-power terminals and antennas.

Teledesic is a private company set up by Microsoft CEO Bill Gates and mobile telephone empire builder Craig McGraw. Aerospace company Boeing has committed up to $US100 million for a 10% share in the company. It will be the prime contractor, organising the design, construction and launch of the network. There is still a large amount of investment needed to pay for the plan, which is probably still about $US8 billion short.

Motorola is keeping the exact cost of its Celestri scheme quiet. The network, which will comprise 62 LEO satellites and one or more geosynchronous satellites, will be the company's third satellite system, but the first to provide high-speed data and video. It, too, will be operational in 2002.

European-based telecommunications company Alcatel Alsthom has announced an application to launch a $US3.5 billion, 64-satellite LEO constellation called SkyBridge. It will be first off the mark if it meets its promised start to operations in 2001. Funds for this scheme will be raised through a combination of equity and debt placements.

Such schemes are fraught with danger. Satellite systems are not cheap (prices have gone down, but it is still a much more expensive option than setting up a terrestrial service). Once built, a successful launch is not guaranteed (Motorola's Iridium network has been delayed by a Cape Canaveral Delta rocket that blew up earlier this year).

Robert Egan, the Gartner Group's research director for satellite technology, said there were concerns with the technology and its impact on the end user. There were "significant challenges to avoid lost information and small, consistent latencies end to end", said Egan.

Details of end-user costs have not been established, and just because access will be provided to areas that now are Internet-free, that doesn't mean it will be in an area that has access to a PC, modem and antenna.

Egan said satellite technology will bring basic telephony and short message services to the 'bandwidth challenged'. Just how long they use such services will depend on costs, and the time it takes the cheaper, easier to deploy and manage terrestrial alternatives to catch up, because they will.

He also urged that illiteracy, poverty, unemployment and ignorance be alleviated through the use of computers. However, this concern for the developing nation's future was not reflected in the billionaire's reported actions. Some of the world's richest man's hotel bills were reportedly paid for by the government.

Three months later, Intel's COO and president, Craig Barrett, went on a two-day visit to India to boost the use of computers. He said Intel planned to invest tens of millions of dollars to promote the importance of IT in the nation. According to Barrett, of India's 500,000 schools, fewer than 5,000 had access to computers, and these were all city-based. He announced a Cyberskool project to promote the use of multimedia computers made with Intel processors.

Apple, too, has launched itself on the market, supplying an Indian Language Kit for writing software applications in three Indian scripts, which allowed users to work with the Hindi, Marathi, Sanskrit, Nepali, Punjabi and Gujarati languages. Users will need a compatible (Mac-based) computer. In a slightly more restricting move, Microsoft is developing a Hindi version of Windows, which will allow Hindi speakers to use the prepackaged program, but not help it develop its own software content.

Net advances

As far as the Internet is concerned, developing nations and emerging economies may have a reprieve from such market activity. At present, Internet companies such as CompuServe, America Online, Lycos and Yahoo are expending energy moving into the more entrenched European markets, as well as the very well-established Japanese Internet arena, where there is significant modem penetration.

There are not significant market opportunities in the rest of Asia, Africa and Latin America — yet, said Paul Noglows, digital media analyst for Hambrecht & Quist and co-author of *Americans Abroad: Seizing the Internet Opportunity Overseas*. "I don't think they'll leave any opportunity stone unturned in the long term, but obviously companies will only start looking into areas when they feel the expense is justified," he said.

That does not mean, however, that there is no concern from nations regarding the information that is reaching them via the Internet, and there are many different ways each nation is dealing with the phe-

Siam behind you

Thailand: The tiger needs a technology feed

Thailand's present state of economic downturn is living proof that its attitude to technology needs to change in order to achieve better economic growth, according to the secretary of Thailand's National IT Committee (the IT policy-making agency), Dr Pichet Duronkaveroj.

While Thailand has achieved economic growth of 10% to 12% in the past decade, it is projected to be half that this year. There is talk of a recession, as the value of the recently floated baht plummets, the property sector collapses, exports fall, interest rates increase and confidence in the government wanes.

The reliance on raw materials production and cheap labour, and investment in non-productive areas such as property need to be switched to an emphasis on the creation of a sustainable economy, and technology has a crucial role to play, said Pichet. Thailand must adapt to and use technology, and move its manufacturing to the creation of sustainable products that provide added value, such as semiconductors, software, telecommunications equipment and peripherals, he said.

Only through information technology can Thailand increase its competitiveness in business, industry and international trade, as well as develop socially, according to the NITC. It outlined the three keys to success as: a national information infrastructure; an educated, skilled population; and a committed government.

And, after 10 years of NITC lobbying (with the help of the National Science and Technology Development Agency), the government has begun listening. It recently adopted the NITC's three keys to success as the pillars of its IT-2000 strategy. In May, the government announced three projects, termed collectively as IT Projects for National Development. About 4.2 billion baht has been budgeted for three projects: a Software Park, the Government Information Network (GINet) and ThaiSarn-III (Thai Social/Scientific, Academic and Research Network).

With Thailand's current economic downturn, private investors and businesses have not been so enthusiastic to spend on IT, however, preferring to put purchases on hold until the economy improves. It's a vicious circle in some respects, as many believe the IT take-up must start now for the economy to again prosper.

"The government appears to be taking the adoption of technology seriously," said Tony Waltham, editor of the *Bangkok Post* newspaper's database section, who has lived in Bangkok for 27 years. "However, a lot of work still needs to be done, and there is a real shortage of skilled engineers or IT professionals in every sector," he added. Shortcomings in the education system don't prepare individuals to become knowledge workers, he said.

"Technology tends to be deployed in rather a haphazard way in many small to medium-sized companies," said Waltham. "[There are] a lot of un-networked PCs, and users who have not really been trained to use the PC productively. Businessmen tend to avoid using computers, for reasons of language and non-familiarity with technology. Typing is seen as a secretary's role. Also, many are not fluent in English and there is a fear of making a mistake, while email in Thai carries its own problems." The Thai alphabet has 44 consonants and over 30 vowel combinations as well as tone marks, so it's not a language you can learn to type easily, he explained.

Dr Pichet said before educating to create knowledge workers, Thailand must first convince the public that the take-up of technology is a crucial requirement for prosperity. 'Upgrading' the workforce is also critical, he said. Roadshows go out to educate school principals about the Internet, and about 70,000 government officials have attended two-day basic computer training courses. The government must make itself a role model for the rest of Thailand in its take-up of technology, he added. He said the nation could also improve its productivity (in light of the current downsizing) if it 'computerised' itself.

"Technology progress is still not as high as we would like," he admitted. For example, he said, some government technology expansion programs require that at least 50% of the products and services used be sourced locally, but good local products are not always available. A telephone expansion program had seen 3 million telephone lines installed in Thailand in the past five years, but most of the equipment needed was imported, because locally produced alternatives were not up to scratch.

The installation of a national phone system is a high priority for Thailand, said Pichet, as telephone communications are still impossible or difficult in many areas. While mobile communications and the fabled satellite Internet services of Teledesic and others are useful, Pichet said a wired line system has to be widely accessible to ensure social equity. While in Bangkok teledensity is about 40, in rural areas it is only three or four lines per 100 inhabitants. By 2000 it is hoped that every one of Thailand's 60,000 villages will have access to a few phone lines. The government is planning to install another 6 million phone lines in the next five years, which will increase Thailand's teledensity to almost 20, said Pichet.

Adoption of the Internet will play an important role in Thailand's economic growth. In the past year, 100 schools in Thailand have been connected to the Net in a scheme where any public school can apply for free Internet access. Pichet is optimistic the Internet, will help Thailand develop socially. The danger of losing cultural identity must be alleviated by Thai groups providing their own information to augment that already available. Also, he said, the Internet could supply the perfect tool for the population to learn English.

Great expectations

While on holidays in India, *APC*'s Nat Tunbridge spotted this Delhi message merchant, offering myriad handy technology services, from printing to Web site design. On eagerly asking to see the Net services offered, he was shown into a bare room containing only a ribbonless typewriter.

Needless to say, no Net surfing was done that day.

nomenon. While some treat the Internet liberally, with little concern for the content that can be accessed, others are censoring the Net in a tussle which sees them embracing the concept, but not all of the information.

Taiwan takes a very liberal stance, and recently released a Chinese-language directory detailing 500 of the world's best porn sites. It lists exactly the kind of sites other Asian nations are trying to avoid their people viewing. Singapore has legislated to make ISPs, newspapers and individuals responsible for ensuring there is no smut or racially degrading material available to its citizens. China has a similar policy on such material, but extends the censorship to include information that could be detrimental to the government. China issued a ban on 100 Web sites last year, which included not only pornographic sites, but also those providing news and humanitarian information.

Before Vietnam was even connected to the Internet its government announced regulations requiring all ISPs to register with the government and agree to inspections. There were (and are) concerns about opening up Vietnam to subversive or harmful material. One year later, the first ISP is about to be licensed, in a step-by-step approach to allowing access to the Internet. Two gateways are planned, in Hanoi and Ho Chi Minh City, and the market will eventually be opened up to other providers.

The Internet is used as a political tool in Korea, as well. According to a June Reuters news report, the South Korean government issued a directive that its citizens not communicate with the north via the Internet.

For developing nations, the concerns are more basic — access and content. Even if an Internet access service is provided in a particular region, and the user owns all of the necessary equipment, they may not have access to a phone line, or the money to pay for the calls and/or service, which can be expensive. (Satellite services may ease the problem in the long term — see 'In the air tonight' on page 104).

And once online, the content may not be suitable. Outside the US, the Internet is not so easily described as 'global', with about 90% of information presented in English. In Asia, said Withford, Internet usage is pretty much restricted to those who can speak English — the educated elite. In many developing nations, even if access were provided for 'ordinary' people in their own language, they would not benefit, as a substantial number of them are illiterate.

Much of the information that is already available in developing nations via more traditional means comes predominantly from developed countries, and there is no equivalent flow back, said Bill Wresch, Fulbright Scholar and author of *Disconnected: Haves and Have Nots in the Information Age*. A popular TV show in Vietnam is 'Charlie's Angels'; in the Ukraine they love 'Santa Barbara', and Africans are into 'Baywatch'. Africa has 12% of the world's population but publishes 2% of the world's books, he said.

In the long term, many hope the Internet can help alleviate this problem, due to its multidirectional nature. But first we must provide all of our global neighbours with the means to create and access content, if they want it. Perhaps it's no longer a case of keeping up with the Joneses, but making sure the Joneses keep pace with us. On their own terms.

It is one thing to assault countries with US-derived, 'Baywatch'-style IT content, software and hardware. It is another to provide them with the opportunities to create their own, appropriate, culturally specific and useful adaptations to support existing indigenous structures and systems.■

How is the media's role changing in the age of the Web? **By Dominique Jackson**

Cyberjournalism

On July 9, Apple announced the resignations of CEO Gilbert Amelio and vice-president of technology Ellen Hancock. Ten minutes later CINET's news.com site had posted the first announcement. Twenty minutes later a full story was up, followed by updates throughout the day. The next day were radio and video interviews with the main players, 17 new articles looking at the resignations from different perspectives, a reader forum, the illustrated history of Apple, graphs and a wealth of links to the relevant press releases, company sites, journalists' email addresses and stock quotes. If you missed all that, you could have received the news in your inbox with CINET's Digital Dispatch newsletter.

Two and a half years earlier, in January 1995, a similar event took place. Borland founder, chairperson and CEO Philippe Khan resigned in a similar atmosphere of urgency to make the once-dominant company profitable again. The information most people received by reading the one or two stories printed several days later in weekly IT publications was less timely, complete or varied.

In the time between those two events, the Web has evolved far faster than any other communication revolution, from an extension of print to a fully-fledged communication medium with unique qualities, and it has left many consumers and most purveyors of traditional media dazed. In the Web Age, we all have to relearn how to read and write.

We are at a point where a significant number of people are starting to get their information from online news services. An estimated 6% of the *Sydney Morning Herald*'s (*SMH*'s) readership of 250,000 read its online edition. Most major newspapers have an online presence. Around 12% of Americans went to the Internet to get news on last year's national election, according to the Pew Research Centre.

Television and radio stations have been slower to adapt, both having a medium more difficult to transmit online than a newspaper's text and images, due to the increased bandwidth needed to receive video or audio, and the need to have multimedia software and hardware installed. Their slowness to adapt also reflects the information-based trend in online media.

Television and radio also primarily provide entertainment rather than information. This is reinforced by the slowness of magazines — again primarily entertainment — to move online, even though, like newspapers, they are print. The only sector of the Australian magazine market to have a significant online presence is that of IT titles, although this is set to change with the joint venture between Microsoft and PBL (the parent company of *APC*) to create online versions of Australian Consolidated Press magazines, including *The Bulletin* and *Cleo*. Australia has one Web-only radio station, Wild FM, and there are several US-based Web sites that mix TV and print, such as MSNBC and CNN.

As the CINET example shows, the kind of information available on the Web is different from that in other media. Not only is the content itself different, but the way consumers interact with information providers has also changed.

The most obvious enhancements to content online are the length, immediacy and varied formats in which the information can be communicated. The Internet is free of space limitations, so it has an infinite capacity to provide news detail. Online news services can provide more detailed news and information than even the best local or specialised newspapers. The amount of coverage CINET gave to the Apple resignations could have filled a whole newspaper. Frequency of updates is another difference. Not being constrained by the printing presses and distribution mechanisms that make daily deadlines necessary for newspapers allows online news services to publish updates at any time. Sites such as CNN often publish local news before local newspapers.

Then there is the ability to include audio and video content through technologies such as RealAudio and RealVideo. The *SMH*'s online edition is "slowly diverting" from straight replication of the paper edition to the inclusion of audio and video, according to Jon Casimir, the newspaper's Internet editor. Casimir also points to the "profoundly different " nature of hypertext as another key differentiator of the online medium.

Hypertext, the main concept behind the navigation of the Web, is the organisation of information units into connected associations that a user can choose to make. The ideal way to create online content is as hypertext written from scratch, according to new media guru Jakob Nielsen's book *Multimedia and Hypertext*. Unfortunately, most content is still produced as straight text, which is then shovelled into Web pages, missing out on hypertext's advantage of giving the user control over the flow of information.

An oft-repeated mistake made by people working in a new medium is to emulate the medium's predecessors. The telephone was at first used for asynchronous transmission, like a telegram. Early radio news consisted of reading a story into a microphone like a newspaper with sound, and television was shot with one camera in a studio like radio with pictures. Conversely, newspapers will have to adapt to compete with the Web. When television was introduced, it was seen as an enormous threat to papers, which responded by adapting.

In his book *The Media and Me*, Stuart Littlemore writes of the situation in Britain where a whole generation had grown up not reading newspapers, leading to the print

media becoming more compatible with television so as to reintroduce people to the newspapers. This led to the emergence of tabloid newspapers that emphasise celebrity, sensationalism and 'sound-bite journalism', a context in which pictures become more important than text. The Internet threatens newspapers by outdoing them in traditionally strong roles; daily listings of sports scores, stock-market prices, weather — all of these can be provided in greater detail and updated more frequently on the Internet. In response, newspapers will need to move further away from simply reporting the previous day's events to offering analysis of the events.

The *SMH* has begun making its newspaper content better suited to hypertext by creating pages of links to articles to keep track of similarly themed stories over several days, so that consumers can read the history of a subject. For example, all the stories about the 1997 Australian federal budget appeared on a dedicated Budget page. "It's a way of simply repackaging what's in paper but then usage is completely different and it's a value-add for the online user," said Casimir.

Hypertext is significant in that it lets the reader decide where they want to go, giving them control. An extension of this is push technology, which allows consumers to choose what information they receive. Push promises to save consumers time and effort by delivering a customised package of news to their desktop. Users set their preferences for what kind of information they wish to receive, in what format and how often.

Push represents a fundamental change to the way we navigate through information. With newspapers, even if readers don't read every article on every page, the sequential navigation mechanism means that most people will turn over each page to get to what they want to read. Along the way, they will probably register headlines even if they weren't looking for them. Even if you bought the newspaper for the sport alone, you couldn't ignore the front-page news.

Push changes this by only delivering to consumers what they have asked for. For example, with the PointCast news delivery service, consumers can specify that their news have a political, American or world focus. They can specify which industries and companies, sports and horoscopes to track, plus much more. In his book *Asleep at the Wheel: Australia on the Superhighway*, John Nieuwenhuizen predicts the advent of television that can learn a person's preferences and present corresponding plot developments. No more Wednesday morning analyses of 'Melrose Place'.

Critics of push have contended that it will narrow people's world view and eliminate a common experience and a common forum for discussion. People will be able to opt for content that doesn't deviate from their world view and have it personalised to such a degree that no-one else has read the same version of the news. Nieuwenhuizen describes the sense of community derived from common media experiences. "Our shared exposure to news, and even infotainment in newspapers and magazines perhaps contributes to a healthier social fabric than otherwise might exist," he wrote.

Despite the fact that push offers more personalised information, it is likely that more and more of the news we receive will have an American slant. In McLuhan's global village, Americans are the biggest audience. Even the content of the *SMH* is already oriented towards readers from the

Media model

CINet Online content

Content is rarely a foundation for online success. In fact, the short history of commercial content ventures on the Internet is a sad tale of untenably bold ambitions, oozing red ink and chronic employment insecurity.

Rising from this field of nightmares is CINet: the Computer Network. CINet has built strong online brand identity through credible and compelling content. Founded in 1992 as an 'integrated media company', CINet is a rare example of meat on the bones of convergence, successfully straddling computers, television and online communications. The company has five TV series (including the award-winning 'CINet Central'), RealAudio-based Internet radio, and some of the Web's most often-visited sites with a claimed 4 million hits daily.

CINet's forethought is evidenced by the numerous axial domain names in its stable (such as tv.com, search.com, download.com and shareware.com), but the company is probably best known to Web surfers for its computer-industry wire service, News.com. Since going live on September 3, 1996, News.com has become a reputable source for real-time news coverage.

Coverage quality is sometimes patchy, but News.com is a serious online challenger to industry household names like PC Week Online and InfoWorld Electric. Under editor-in-chief Christopher Barr, a veteran of *PC Magazine* online ventures dating back to the 1980s, News.com is renowned for up-to-the-minute coverage of industry machinations. For example, after the recent demise of Apple CEO Gil Amelio, Barr said CINet's first bulletin went online within 10 minutes of the first announcement, with a full story following 20 minutes later. The online medium allowed News.com to update and revise the story as more information emerged — a classic wire-service model.

"CINet is built from the ground up to deliver news over the Internet," said Barr. "We're not repurposing news, we're not taking it from TV or radio and putting it online — we built News.com from the code up to send stories out immediately. It's changed the way people report and receive technology news."

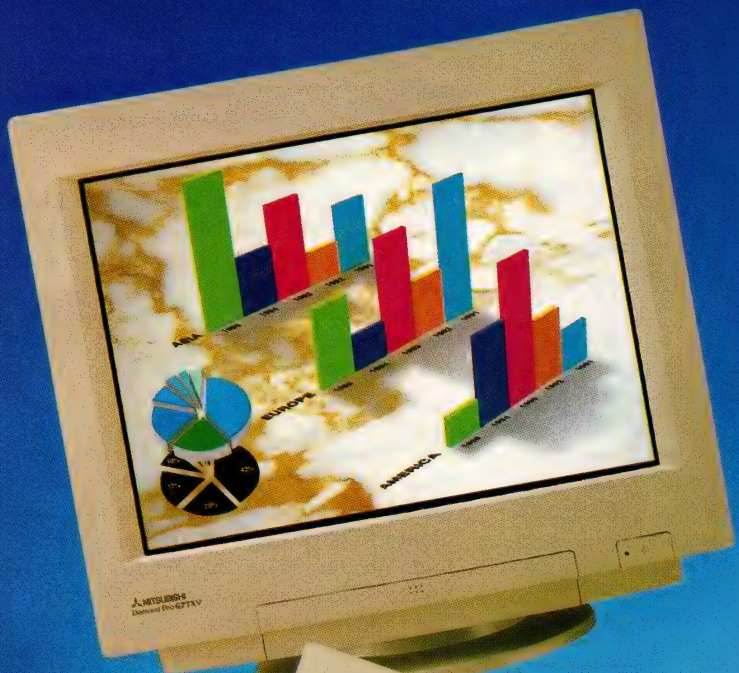
News.com built an Internet-focused editorial production system from the ground up. "Before we built a site, first we had to build a hammer then we had to build a nail," recalled Barr. "We have reusable code so that if we launch a new site there's much we can pull from our architecture, so we don't have to build a new hammer every time."

Barr believes online offers a more inclusive medium, filtering news from established wires like Reuters and referencing other Web content, including competitors. "We recognise that while we're small we can't do everything. We take in other services . . . to provide stories that we've missed, or another perspective."

The chief strengths in online publishing are scalability and timeliness, according to Barr. "We can use the scalability of the network to add users and add new services very easily with minimal cost. That's where the economy really comes in."

Nevertheless, Barr does not expect online to supplant paper. "Paper is a really great medium, but for immediate news online just can't be beaten. Weekly and monthly magazines' tone will change because they'll get more analytical and less news focused because real-time news delivery will be over the Internet, radio and TV."

Dan Tebbutt



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Public scrutiny on the Net

Feeling the Serb heat

Accountability — directly acknowledging the sources of your work, and being directly answerable to the audience that consumes that work — is one of the most potentially valuable changes the Internet is bringing to journalism. For authors working in the less factually-centred realms of fiction and humour, however, accountability can wreak unexpected changes in the creative process.

One writer who learned that lesson was American humorist Joe Queenan, who in April and May 1996 made a switch from his regular occupations of writing "sarcastic financial journalism", acerbic film criticism and "generally mean-spirited material" to accept a commission from the Mr Showbiz celebrity Web site: write the Great American Novel in three days, and write it on their site, posting each chapter as soon as it was done. Queenan obliged, producing the 22-chapter opus *Serb Heat*.

The notion of publishing a partly-finished story in chapters is not exactly new — Charles Dickens produced much of his work in this way. But it wasn't just in writing a story about a crazed Serb militiaman who travels to the US to kill off a journalist who had witnessed his accidental slaying of a failed feminist icon staging 'State Fair' in Sarajevo that Queenan differed from his infinitely less amusing Victorian predecessor. Even the most efficient of printing systems couldn't have produced a chapter every two hours, as Queenan did; and Dickens did not have to face a barrage of email from readers commenting on the work in progress while he wrote, as Queenan did.

It was this email factor that demonstrated how the online creative process can differ measurably from its earlier, print-centric counterparts. One of Queenan's trademarks as a writer is his ability to lampoon politically correct behaviour. In his film script 'Twelve Steps to Death', the "obscenely fat" murder suspect Amber Duggan manages to prove that she couldn't have killed her psychiatrist by demonstrating that she is too obese to have squeezed through the doorway leading to the murder scene, even when she's wearing a bathing suit and covered in margarine.

The early chapters of *Serb Heat* maintain the same tone, with Queenan establishing as his central characters a group of dim-witted Serb border guards who "want to be treated like men who look like Rambo".

As he later recounted in an article for *Forbes* magazine in December 1996, Queenan had every intention of maintaining his take-on-all-comers insults until the final chapter, but audience reaction forced him to change his mind, fast. "Scant minutes after I had posted the first chapter of *Serb Heat*, which introduced Ratko Krudzik and his murderous comrades, I began to receive hate mail from wronged Serbs all over the world," Queenan wrote. "The vast majority of people who sent emails thought I was the scum of the earth."

Buckling under the pressure, Queenan essayed a switch which took the focus entirely off the Serbs (we won't reveal it here because the novel is worth reading if your taste runs to vicious, barbed humour). That even as thick-skinned a writer as Queenan could have succumbed to such commentary from his audience shows how the online world can substantively alter the creative products built within it. With readers able to directly influence a work in its formative stages, literature of all kinds may take on a very different nature. Or as Queenan himself put it: "Our new communications technologies, far from making us freer and more courageous, have a terrifying capacity to turn us all into lily-livered mushmouths."

Angus Kidman

Serb Heat can be found online at http://www.mrshowbiz.com/features/writers/fiction/serbheat/archive.html.

US. Casimir said he makes sure articles relating to the US are always included in the online edition, to cater to the newspaper's significant American audience.

The ability to filter their own information means consumers are performing a role traditionally performed by journalists. Historically, journalists served as gatekeepers and agenda setters, controlling information inaccessible to the public. Guided by their own standards of newsworthiness, relevance, taste and suitability to advertisers and public interest, and constrained by the available space and time, journalists have long decided to what and how much their audience will be exposed. The public perceived the journalist or television program as a source rather than a starting point for information.

On the Internet there are no time or space limits and ultimately no gatekeepers. 'Disintermediation' is the name given to this process of taking out the middle man. Anyone can disseminate information instantly, throughout the world, without having to use the press as intermediary. But the fact that anyone can set up a news service for a low cost doesn't mean it will be any good. In his book *Normal service won't be resumed*, Australian science journalist Robyn Williams wrote about television: "The New Age broadcasters are assuming that quality will simply emerge from all the unlimited opportunities. I think they are wrong".

Clearly, along with increased control, the role of the consumer in the Web Age brings added responsibility. Internet commentator Dale Spender welcomes disintermediation and the prospects for the freedom to publish that the new medium offers. However, she says, consonant with that freedom is a twofold responsibility: firstly on the part of the information provider and secondly on the part of the information consumer.

In a world where information is power, disintermediation is a change in the balance of power. On the one hand, it lessens the public's reliance on journalists. On the other hand, the tidal wave of unfiltered information places the burden of responsibility on the consumer. To cope, consumers will most likely look to a reliable mediator. For this reason, the journalists' role is not diminished, even though disintermediation may at first seem a threat to their power.

Disintermediation forces journalists to take a more demanding role, Casimir said. "A hundred and fifty years ago when the *Herald* started it was in the business of providing information to the information-starved. The *Herald* now filters information

for the information-drenched. We give raw information context, edit it and give it meaning. We process it for you," he said.

"There are two kinds of experts: the ones that have access to information, and the ones that can explain and contextualise information," said Casimir. "Only the latter will survive."

The mandate of journalists in this new role will be to filter information and offer the stamp of reliability. The number of Web pages is increasing exponentially. Most people have neither the time nor the skill to find, sort and evaluate all the information that exists on the Web. Secondly, consumers want a guarantee that the news they are getting is comprehensive and factual. Starting an online news service may not require an expensive production setup, but it does need experienced journalists who know how to cultivate sources and double-check information. Established news providers have the advantage here, already having a news-gathering setup, fact-checking procedures, and established editorial standards. Consumers recognise this, which makes the news providers' branding a powerful stamp of legitimacy.

Legitimacy is a big selling point. Readers of newspapers such as *The Australian* or the *SMH* expect that the information they read will be factual, vetted by lawyers and editors. Consumers want this same guarantee on the Web but are wary of new information providers, and with good reason. To set up an online publication (though not necessarily a good one) costs far less than setting up traditional media, due to the reduced content and distribution costs. In addition, slick Web publishing can allow amateurish reporting to look professional.

Although it may be wrong to assume that a publication or show that's expensive to produce is any more credible than a cheap one, this is the common perception. There may be some logic to the assumption that the more money is spent, the more there is at stake, and paying attention to credibility will protect a producer's own credibility. Accordingly, the Internet is commonly perceived as unreliable.

Legitimacy of information found on the Internet is a problem for journalists as well. Online information may be readily available, but it is not always reliable. A recent example of this appeared in Australian magazine *MAX* from Next Publishing. An article entitled 'The Wrong Arm of the Law' by Carl Hammerschmidt (July, page 18) that purported to highlight arcane American laws, was entirely sourced from the Web. The source Web sites were all supplied, with the URLs. The sources, however, were personal home pages, not belonging to legal bodies nor in any way official. The information contained on the sites was, according to one source, "found in various locations around the Net — Usenet, other Web pages, and so on". Hammerschmidt said that although he did not check the veracity of the laws "in this case", he did believe it was the responsibility of the journalist to ensure that information published in the magazine was factual. Hammerschmidt also said he believed that simply acknowledging the source of the material was thought to be sufficient among most journalists.

"People have a tendency to believe that if something is written down, it takes on an authority," said Chris Warren, Media Entertainment and Arts Alliance (MEAA) federal secretary. "This has made some online reporters lazy about verifying original source material." Applicability of the Journalists' Code of Ethics to the new media over the next 10 years is currently under review by the MEAA's Ethics Review Committee. Until the committee delivers its decision at the end of the year, Warren suggested information providers use a system of ethics mentors — senior journalists who can advise on ethical questions.

To Jon Casimir, the danger is exaggerated. "Is writing different online? It's almost patronising to say that. Good writing is good writing." Researching standards for traditional media should hold true for online reporting, according to Casimir. "You should be sceptical of information you get from anywhere."

The need for experienced, ethical journalists favours existing media companies. In the Australian market where the total amount of Web advertising is estimated at less than $1 million, the capitalisation costs of setting up a credible new service will prove a barrier to most new media companies, according to Casimir. "I think it is drearily inevitable that the same people who controlled the offline media will control online."

This view is shared by Zeb Rice, News Interactive's general manager. "Being a part of [a large] media company is, of course, an asset," he said. The revenues of News Interactive, which is in the process of moving News Limited's 107 newspapers online, are a fraction of the billions turned over by its parent company. Rice does not anticipate a profit for News Interactive, which began in late 1995, until at least next year. "Even with the size of the market on a national basis, it is difficult to run a profitable online business."

Most companies with an online presence are waiting out the lag time until profitability, including Time Warner's Pathfinder, said to be losing between $US5 million and $US10 million a year. Another Web casualty was popular online soap *The Spot*, which ended in June after financial difficulties. Although it was the best-known online soap, and had attracted advertisers over its two-year run, production costs still outweighed revenue.

Some observers believe that, for all the hype about disintermediation allowing Mum-and-Dad newspapers, the Web will only lead to a smaller number of media proprietors. In *The Media and Me*, Stuart Littlemore wrote, "In my period outside the media, looking in, I had to admit that public confidence in media standards had fallen to its lowest level in living memory, and largely as a direct consequence of the ever-greater concentration of ownership of those media. The creation of 'new media' — Pay-TV, cable, satellite services, pay-for-view, the Internet — is only seeing that same domination increase."

Starting an online news service may not require an expensive production setup, but it does need experienced journalists who know how to cultivate sources and double-check information.

News Interactive's Rice disputes the disintermediation theory. "The Internet is an opportunity for re-intermediation," he said. Instead of eliminating the middleman, Rice argues that online publishing changes the players, so that content providers now have to go through telcos, ISPs and hardware and software providers. Rice concedes that reintermediation is at a lower level — "You have a lower cost base and can accept a lower margin at a profit" — but says it is the reason so few content providers are making money. With some exceptions, including C|NET (see 'C|Net: Online content success story'), the companies that can afford to get in early on the Web, then wait out the dry spell, will be the traditionally dominant

Tailoring online content

Slate I'm in

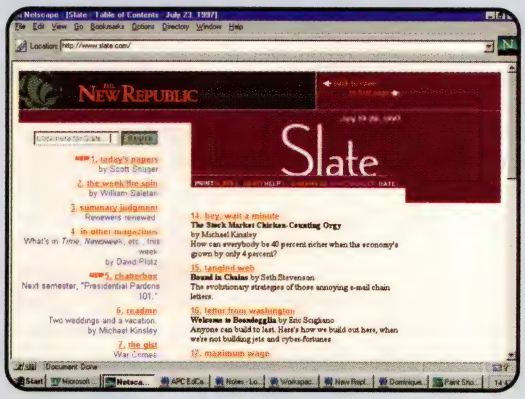
Slate, the online zine that debuted with so much fanfare, recently celebrated its first birthday. It has been a high-profile media experiment for Microsoft, meeting with mixed success.

The Slate experiment is notable for several reasons. It is a high-profile project with a big budget, well-known staffers and a lofty premise. It is one of Microsoft's first attempts to create 'mainstream' content. Most interestingly, it provides an example of how the Web publishing landscape has changed over the past year and, if it succeeds, it will provide a blueprint for future Microsoft media projects. If Web publishing is more a case study in failed expectations than outright failure, then Slate's publishers have certainly had to change their views.

Started a year ago by editor Michael Kinsley, Slate is a weekly public-affairs magazine aimed at the educated and politically aware. The former editor of *The New Republic* magazine and a star of traditional journalism, Kinsley received an inordinate amount of press when he joined Microsoft's Redmond campus, instantly raising the profile of online magazines. Kinsley said he took the job with Microsoft to prove that publishers can operate profitable Internet-based magazines. In early interviews, he had a newbie's stars in the eyes regarding technology, praising the merits of email and wanting every story to come with an audio clip, just because it could.

Vacillating between saying the Internet would be "a great gift from technology to democracy" if it aided self-supporting journalism and saying Slate intended to "take a fairly skeptical stance toward the romance and rapidly escalating vanity of cyberspace", Kinsley was hedging his bets. But some confusion is understandable.

Less understandable is what was seen as Kinsley's superior attitude towards existing online magazines. His assertion that Slate would be the first magazine to offer serious journalism online immediately garnered it a parody, Stale, started by US freelance journalist Daniel Radosh.



The format of the magazine has changed considerably over the year. Many of the mistakes made were, predictably enough, as a result of emulating the print media too closely. Some faults in Web site design pointed out by interface guru Jakob Nielsen (see main story) have been corrected — the cover and contents pages have been merged into one home page — but others remain. The articles are still very long (Kinsley saw length as the hallmark of a serious publication, although Nielsen contends it does not make for comfortable onscreen reading) but they usually spread across different pages. It still uses page numbers even though they are redundant in a non-linear medium like the Web. The magazine now works on a continuous-update model, even though Kinsley initially spoke of "going to press" once a week. There was initially a paper edition of Slate distributed through Starbucks upmarket coffee chain, but this was soon dumped. A weekly edition of Slate is now available on paper, by subscription only, at a cost of $70 per year.

The original plan was to start charging a $US19.95 annual fee for content in November 1996. Kinsley initially eschewed an advertising-only model, saying that a reader-pays revenue model was "the only way serious journalism on the Web can be self-supporting." This sounded disingenuous, given that Slate is owned by the richest man in the US. Slate's publishers postponed, then eventually dropped the idea. They cited the lack of a suitable billing mechanism, although it's more likely that they realised that in the current free-for-all climate of the Web, subscriptions are a tough sell. Kinsley has since said he believes it will be two or three years before he and Microsoft even know if it's possible to make money from Slate. Initially they were aiming for a paid circulation of about 100,000. In October, Kinsley said Microsoft estimated that 10,000 readers visit the site each day. In announcing the decision to push back subscriptions, Slate's publisher Rogers Weed said Slate was reaching about 35,000 readers per week. While it's hard to compare these figures as they have different bases, they do suggest that Slate is a long way from achieving profitability, or even reader targets. It's been a tough year, but Kinsley can take consolation in the fact that no-one else has the answer yet either.

Dominique Jackson

media companies, as well as a new kind of media baron: the technology provider.

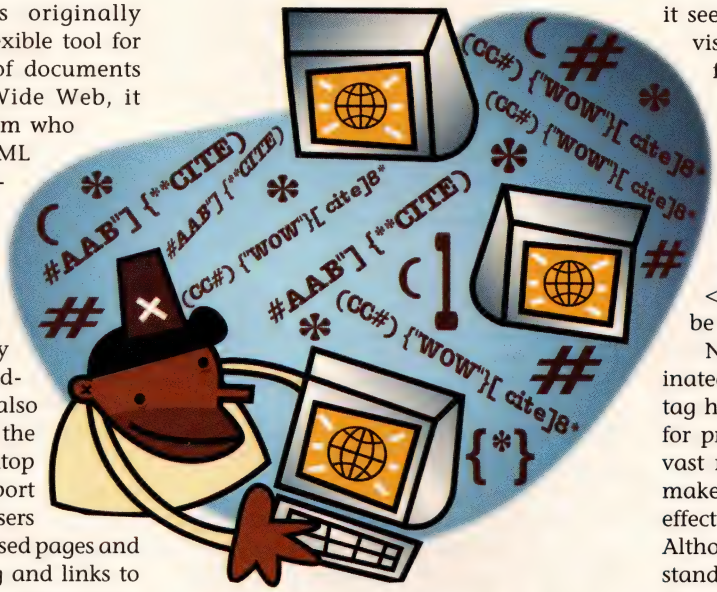
According to Rice's reintermediation theory, it makes sense for the middlemen to get into the content-provision business themselves. The best-known example is Microsoft, which has poured billions of dollars into its nascent online media company. Moving to such a different business, however, is problematic. To be successful usually means having to buy the content from an experienced content provider. Again, the prime example is Microsoft. A recent *Wall Street Journal* article reported that Microsoft's MSN online service, which has attempted to sell subscriptions for its entertainment content, is struggling. Consumers are spending about 70% of their online time on the Web, rather than in MSN's exclusive content areas. One of Microsoft's few examples of successful content provision is the online magazine Slate (see 'Slate I'm in'). So Microsoft has teamed with television broadcaster NBC to create the MSNBC channel and bought US cable TV network Comcast, among others. Another example is Netscape, which features content from *APC*, IDG publications, Sony Music, Knight Ridder and *The New York Times* in its InBox Direct email newsletter.

If this picture looks fuzzy, that's because it is. Barely two years old, the online communication medium is growing rapidly and changing form every day. While it is important to monitor changes in the Web, we need to keep its small size in perspective and not exaggerate the significance of the audience.■

The Extensible Markup Language has been proposed as a means of making it easier to create data structures online. What problems is it trying to solve, and how likely is it to succeed? **By Angus Kidman**

XML marks the spot

Although it was originally designed as a flexible tool for the formatting of documents on the World Wide Web, it seems unlikely that the team who originally designed HTML realised just quite how flexible it was eventually going to have to become. Today HTML (Hypertext Markup Language) is not merely expected to cope with the presentation of fairly straightforward text-and-graphics documents; it is also expected to be able to mimic the output of professional desktop publishing programs, support database querying, allow users to define their own personalised pages and incorporate simple scripting and links to complex pieces of program code. In short, people are trying to use HTML for tasks it wasn't designed for, and its flexibility can only be taken so far.



You don't need to have tried authoring in HTML to be aware of the problems this has created. As the market's two leading browsers — Netscape's Navigator and Microsoft's Internet Explorer — continue to pursue these goals by adding new, non-standard tags, it becomes harder and harder to ensure that any given Web page will appear in an equally readable format for all users. Just because it looks fine in IE is no guarantee that it will work in another browser, especially if you use a Web page editing tool and so aren't aware of what HTML code is being used to produce the effects you're seeking.

The problem has been exacerbated because of a fundamental conflict between the original concept of HTML and the way designers work. HTML incorporates two kinds of styles: logical and physical. Logical styles are used in sequences such as the following:

```
<H3>Great Nuns Of Russia</H3>
```

This indicates that the words 'Great Nuns Of Russia' are to be displayed as a size three document heading; the <H3> sequence of characters is known as a tag. It is up to the individual browser to determine exactly what such a heading looks like (typically, it will be bolded, larger than standard text and will have double line-spacing after it).

Physical styles, on the other hand, dictate more precisely the appearance of text or images in a document. The HTML sequence

```
<I>Wouldn't It Be Good</I>
```

for instance, is used to display the text *Wouldn't It Be Good* in italics.

Logical styles are preferable from a consistency point of view, because they will render on a wide variety of different systems and avoid overburdening a document with formatting details. However, it seems that the human propensity for visual thinking has led to a preference for physical styles. Microsoft's own description of how HTML works in some white papers completely ignores the existence of logical styles. It is far from alone in this respect. This trend has become even more pronounced with the emergence of newer tags such as <FONT>, which allows documents to be displayed in a specified typeface.

Not only have physical styles predominated over logical ones, but the <TABLE> tag has also become a de facto standard for providing page-style formatting. The vast majority of commercial Web pages make use of this tag to provide formatting effects that would otherwise be impossible. Although the <TABLE> tag has now been standardised, it is far from an ideal solution, principally because it fails to render accurately in many cases.

Users in text-only browsers will often see table-centric sites as a garbled mess; problems with table resolution can exacerbate delays for users on slow connections; and Web surfers with sight problems who rely on speech synthesis also get relatively little idea of page structure when tables are used. Style sheets, which allow particular styles to be associated with a document, go some way towards solving the formatting side of the problem, but have yet to be officially ratified, although both Microsoft and Netscape support them in their latest releases.

A third difficulty with HTML relates to the continuing growth of the Web. As more and more documents appear online, searching through them gets harder and harder. This is because, as a rule, such documents lack any internal structure that indicates the type of data contained within them. If, for instance, I carry out a search on the number 2000, there is nothing intrinsic to HTML that

enables page authors to differentiate between the year 2000, the number 2,000 as a street address, $2,000 as a price, and 2000 as the postcode of businesses in central Sydney.

The World Wide Web Consortium (W3C), a vendor-neutral group which has the deeply unpopular job of trying to impose standards order onto the Web (and the software developers who insist on flouting its conventions), recognised these problems late last year when it began working on a new specification for a different kind of markup language, known as the Extensible Markup Language, or XML for short.

Enter XML

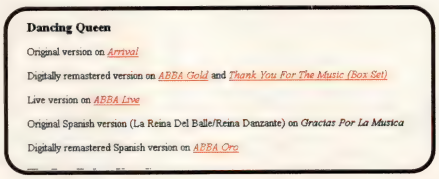
The W3C's initial aim in creating XML was to provide a method of rendering Standard Generalised Markup Language (SGML) on the Web. SGML is an International Standards Organisation defined metalanguage (ISO 8879) for describing the structure and formatting of documents in a flexible but completely standardised manner. Because the standard is defined by a recognised body, rather than an individual company, it is freely available in its entirety for anybody to use. (The same cannot be said of common but proprietary document). Formats such as Microsoft Word, which can be changed at whim by their creators; for a discussion of the consequences of this, see *APC* July, page 19. This is one of the reasons why open document standards have survived the popularity of such alternatives, even though critics charge that the standards development process is too slow.)

HTML, in its standardised form, is actually a specific subtype of SGML. Technically speaking, it's an application profile of SGML, designed for application in just one area. Since the original intention in designing HTML was essentially to render existing documents in a hyperlinked format, it includes support for features such as titles, headings, paragraphs and lists. These work well for producing report-style documents, but don't necessarily answer the challenge of replicating magazine design online (many attempts at this notwithstanding) or providing access to specific and structured data.

SGML, on the other hand, offers a much more generalised method of describing documents, making it suitable for many formats online or otherwise not easily addressed by HTML. It would theoretically be possible to render SGML directly on the Web, and indeed a number of commercial and SGML browsers exist, such as SoftQuad's Panorama and Citec's Multidoc Pro.

However, to do so in a manner conforming to the ISO standard would be time-consuming and invoke a number of essentially unnecessary features for large numbers of users. While the solution of existing browser vendors to this conundrum might have been to simply not conform to the standard, the W3C envisaged the possibility of creating a cut-down form of SGML which remained compliant but eliminated some of the clutter.

XML was thus created as another application profile of SGML, specifically designed to be rendered online and relatively easily comprehended by human authors, and with greater flexibility in document definition than HTML. While it may act as an alternative to HTML in many instances, the W3C emphasises that it is not a replacement for it and that



HTML documents will remain important for some time to come.

XML has been designed so that XML-processing software can be called upon by a variety of applications whenever an XML document is encountered. Thus viewing XML documents is not likely to require a totally new browsing environment. Extensions to existing browsers, or any software currently used for information viewing and processing, will be the preferred path to making the world XML-ready. (Existing SGML browsers will, of course, be able to read XML documents.) The W3C also anticipates that a library of standard components for processing XML documents will emerge, reducing the need for duplicative development efforts.

Spot the difference

Notwithstanding the distinction between them, many users will be approaching XML from a background of working with HTML. While there are a number of key differences between HTML and XML, the most important relates to the 'Extensible' in the name of the latter. HTML can only ever work with a specific set of document tags, and it will ignore any others that it encounters — with sometimes unpredictable results.

XML, on the other hand, is designed to allow Webmasters to add their own custom tags to define any type of data that they wish to make available in a Web environment. While the tags are primarily intended to indicate data structure, they can also be used to add formatting effects, by associating particular tags with formats in a style sheet.

A practical example may help illustrate the point. One of my non-*APC* Web projects is a comprehensive listing of every track by Swedish pop group ABBA that is available on CD (the current version is located at http://apcmag.com/gusworld/abba/abbacd.htm). Here's a sample entry from within that document in HTML:

```
<a name="DQ"></a><h3>Dancing
Queen</h3>
Original version on <a
href="#AAR"><cite>Arrival</cite>
</a><P>
Digitally remastered version
on <a href="#AAG"><cite>ABBA
Gold</cite></a> and <a
href="#ATYFTM"><cite>Thank You
For The Music (Box
Set)</cite></a><P>
Live version on <a
href="#AAL"><cite>ABBA
Live</cite></a><P>
Original Spanish version (La
Reina Del Balle/Reina Danzante)
on <cite>Gracias Por La
Musica</cite><P>
Digitally remastered Spanish
version on <a
href="#AAO"><cite>ABBA
Oro</cite}}</a><P>
```

Although this is not an especially complex document compared to much of what resides on the Web at the moment, it is still reasonably difficult reading even if you have a good knowledge of HTML. And the physical form it realises onscreen is considerably less complex than the formatting might suggest (see picture). In an XML format, the same fragment might appear something like this:

```
<entry>
<songtitle>Dancing
Queen</songtitle>
Original version on <album-
link>Arrival</albumlink>
Digitally remastered version
on <albumlink>ABBA Gold</album-
link> and <albumlink>Thank You
For The Music (Box Set)</album-
link>
Live version on
<albumlink>ABBA Live</albumlink>
```

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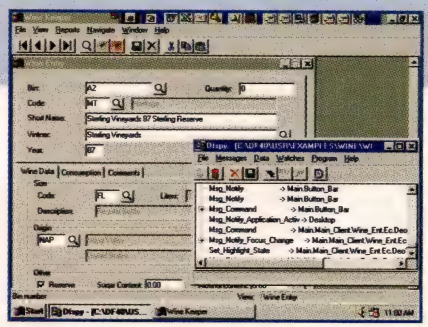

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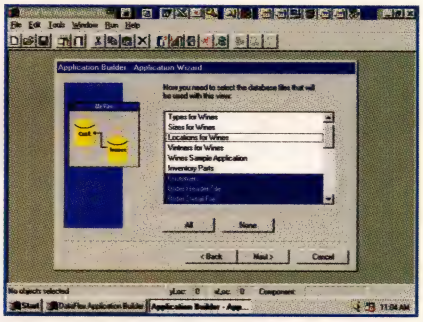
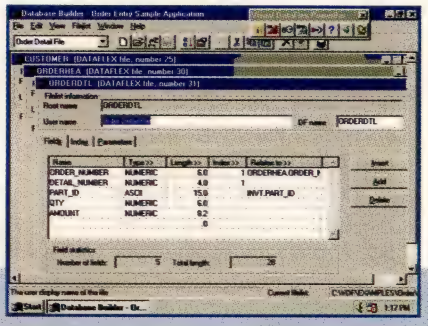
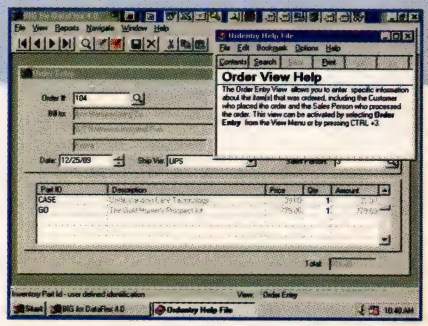


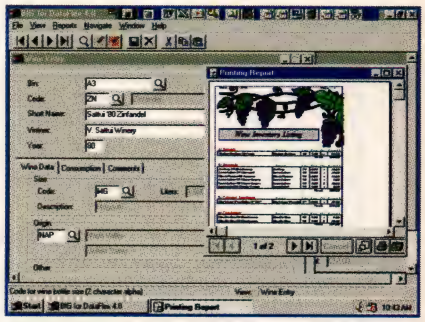
AppBuilder - Application Wizard



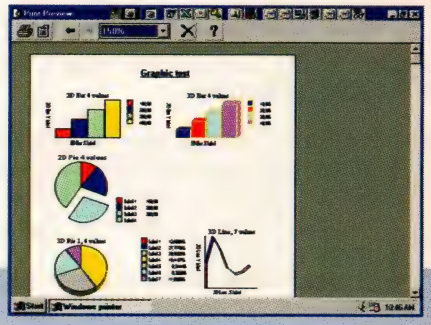
Database Builder - Define your application workspaces



A sample application using help



A WinQL report called within VDF



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```
  Original Spanish version (La
Reina Del Balle/Reina Danzante)
on <album>Gracias Por La
Musica</album>
  Digitally remastered Spanish
version on <albumlink>ABBA
Oro</albumlink>
  </entry>
```

There are three obvious advantages to the latter style of tagging:

- The XML document is much easier to read, both from the point of view of a human author and for machine processing. Instead of a series of tags, some relating to formatting and some to hyperlinking, each data type is associated with a single, straightforward tag, such as <songtitle>.
- Because the physical styles associated with each of the specific XML tags will be defined in an associated stylesheet, the formatting of a particular tag can be changed at any time without requiring every document using it to be edited. (Something of the same effect can be achieved in HTML using stylesheets.)
- The data contained in the document is far easier to process for search engines and database applications, because specific details (such as album titles) are explicitly flagged as such.

While this is a relatively small and trivial example, the principles it embodies go a long way towards demonstrating the potential power of XML: flexibility in the user definition of data structures, combined with fairly rigorous rules than ensure those structures can easily be interpreted.

XML issues

Of course, such a scheme immediately raises some questions. The most obvious is: just how does an application know how to interpret the specific XML tags in any given document?

The answer to this question comes in two parts. To create a set of XML tags, you ideally need to create an XML document type definition, or DTD. This defines the tags that will be included in your specific document type, and the kind of data that they will contain. In the example above, for instance, I might choose to create an ABBA-fan specific DTD, or a more general discography DTD, including entities such as <songtitle> and <album>.

Once the document type has been created, the first lines of any XML document need to specify the XML version and DTD it is based on, by providing an explicit reference to a DTD file. Such a command will most likely look something like this:

```
<?XML VERSION="1.0"?>
<!doctype abba system
"http:/apcmag.com/gusworld/abba/
abba.dtd">
```

XML also supports document type definitions being embedded in the actual document, although this does affect both readability and portability, since changes won't necessarily be reflected in other files, even if they share a similar structure. XML files which have an explicitly created DTD are referred to as 'valid', because they have a defined structure. They can also be optionally associated with a style sheet to demonstrate how they should be formatted.

However, XML also offers the option of creating a document not associated with a formally declared type, by using the following variant of the version command:

```
<?XML VERSION="1.0" RMD="NONE"?>
```

XML refers to documents of this type as 'well-formed'. The ability to parse well-formed documents is one of the few major differences between SGML and XML. XML processors can also make some elementary deductions about the formatting of well-formed documents, based on the way in which they are laid out (this is an important difference between HTML and XML; see 'The vexed issue of white space').

A second question that arises is what happens to existing HTML content. Converting existing HTML files into XML-compliant files is not especially difficult, but there are some pitfalls. One important distinction between XML and HTML is that the former is much stricter about formatting consistency. Tags are not allowed to be overlapped (this is also a requirement in HTML, but many browsers ignore it). As well, both starting tags and ending tags must be included when they are required. Thus the tagged sequence

```
<li> First Stage</li>
```

is valid in both HTML and XML, but

```
<li> First Stage
```

is only acceptable within HTML. Elements which by definition do not include an ending tag (such as the HTML <HR> element, which creates a horizontal rule across the page), need to have a backslash included after the element name in XML, thus: <HR/>. This requirement again differs from SGML, but makes parsing files to determine the end of tags much simpler

Switching standards

The vexed issue of white space

One of the features of HTML which many authors initially find confusing is that instances of 'white space' (carriage returns, tabs and excess spaces) are not significant in formatting a document. As far as an HTML browser is concerned, if you type 20 spaces before a word, that's exactly the same as typing one, and carriage returns are similarly treated.

One of the great advantages of this system is that it forces authors to think explicitly about how their documents will format online, and it also allows the use of white space to make raw HTML easier to read. For instance, when the often-used <TABLE> command is nested in a document, each level can be indented to make it clear which element belongs to each table.

XML redefines this approach to white space, however. As the XML draft specification makes clear, white space may be significant and the decision as to whether to include it when formatting documents is not an absolute one.

"An XML processor must always pass all characters in a document that are not markup through to the application," the paper said. "A validating XML processor must distinguish white space in element content from other non-markup characters and signal to the application that white space in element content is not significant."

The specification makes the valid point that certain types of documents, such as poetry and source code, make extensive use of indentation and white space and this needs to be accommodated.

While it is not yet clear just how this will be implemented in individual XML applications, the message is clear: the onus is on the author to ensure white space is used appropriately. This presents a potential problem for visual HTML editors such as Microsoft's FrontPage, which adds indentations to source code that appear to make the text easier to read but are completely arbitrary with respect to its structure. If these documents are converted to an XML-compliant format, all those spaces may need to be eliminated.

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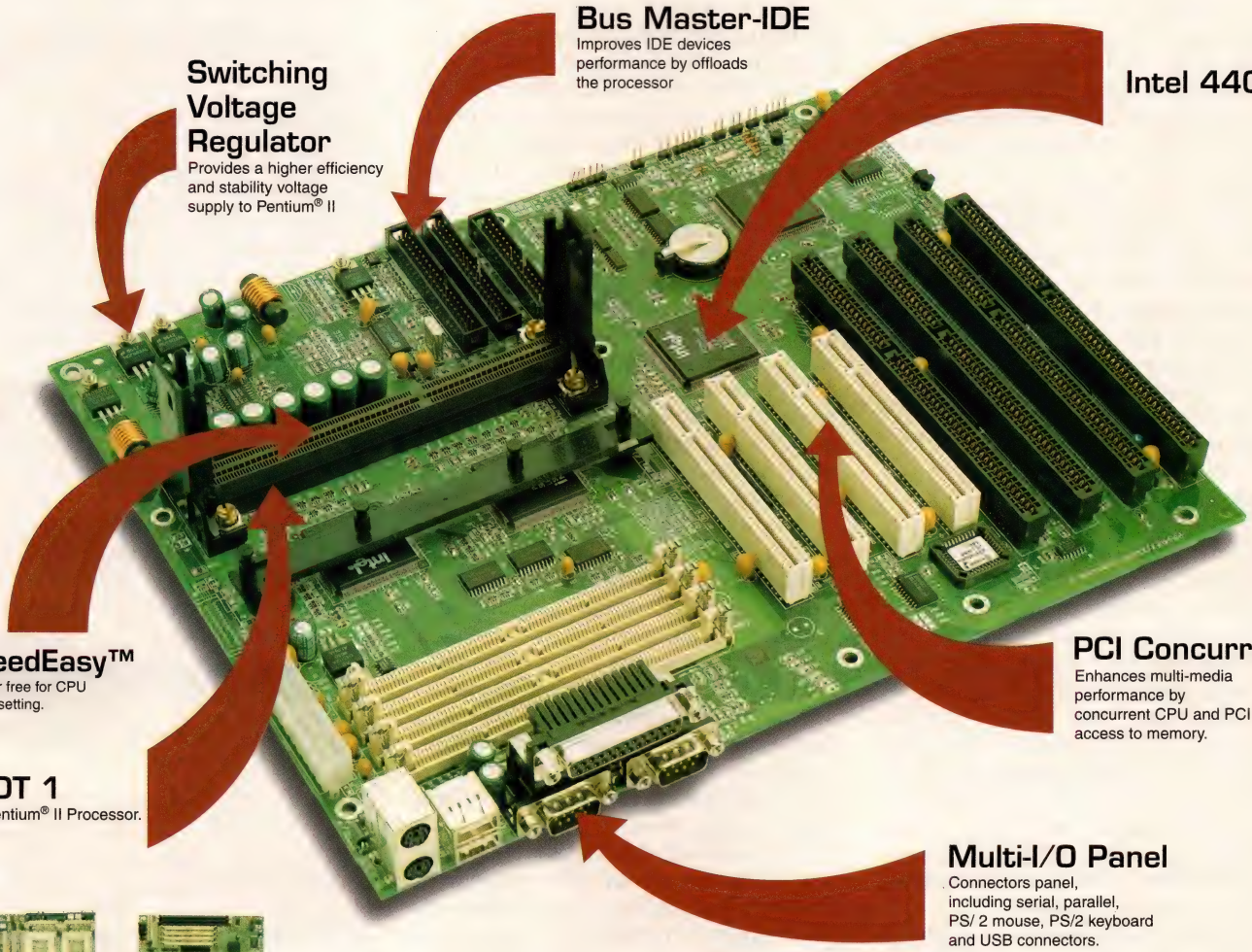

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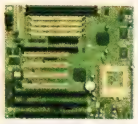
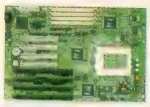
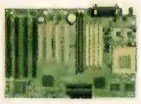

P5I430TX-250
TITANIUM I/IB


P6I440FX
COMMANDER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for machine processing. A file only qualifies as well-formed if it meets this particular requirement.

XML also provides more powerful implementations of linking, including the ability to link to specific sections of a document, and sub-sections of those sections. However, XML will support standard HTML-style linking — provided it is defined in an appropriate DTD. It should in fact be possible to completely define HTML as a specific XML DTD, and this is likely to be one of the first projects completed when the standard is finalised. At the moment, opening an XML-compliant file in an HTML browser will most likely result in gibberish or a plain-text document, since the explicit document type declarations required can confuse the browser.

XML offenders

XML is yet to be completed as a specification, and the W3C has offered no firm timeline as to when that might occur. The basic specifications for syntax and hyperlinking were completed in July, and a language for creating stylesheets associated with XML document types (based on the SGML-related DSSSL standard) is due to be completed by December of this year. That will be the earliest point at which XML can become a ratified standard, but it is likely to appear somewhat later, to allow further discussion of the draft documents.

However, implementations of specific XML-based DTDs have already begun. The W3C envisages that DTDs could be created for all kinds of interest groups (the XML FAQ wistfully lists linguistics, finance, knitting and rabbit-keeping as possible candidates), and different browsing systems used to access them. However, the two most prominent companies to have embraced XML so far — Microsoft and Netscape — both have fairly mass-market purposes in mind.

Microsoft has utilised XML to design its Channel Definition Format (CDF), which will be used by Internet Explorer 4.0 to provide access to subscription 'channels' of automatically updated Internet content. Microsoft submitted CDF to the W3C as a proposed standard in March. CDF is also at the basis of the PointCast Network's new channel system, so it should enjoy fairly broad support.

However, a white paper from Microsoft indicates that, while it is supportive of the XML concept, it clearly isn't interested in embracing the standards spirit with both hands. Its future proposals for the scheme include an "efficient compression scheme" (which would go against readability). As well, the CDF includes XML elements designed to work only with Internet Explorer 4.0, such as tags to indicate how to place content on the IE Active Desktop.

Netscape has a broader plan in mind. It initially declined to be involved with the XML specification, claiming that the extensions were unnecessary. However, it now wants to use XML to implement support for Meta Content Format (MCF), the Apple-invented system for describing and extracting information from Web content. Products from Netscape with MCF support are unlikely to be available before 1998, and the company has pledged not to include the feature until the MCF standard is ratified by the W3C. (For a detailed discussion of MCF, see *APC* March, page 124).

While any move by these formerly anti-standards companies to embrace a system that is not of their own creation is welcome, on their own the CDF and MCF implementations are unlikely to create a mass-market rush towards XML. Indeed, because both systems will be designed to work hand in hand with browsers that are already top-heavy with proprietary HTML extensions, they are unlikely to promote XML-based systems to the exclusion of less flexible alternatives.

The most likely candidates for taking up XML technology initially will be large organisations, where data-processing needs are more urgent and where many companies already rely to some extent on automated procedures for the production of Internet and intranet content. In such an environment, switching from producing HTML on the fly to producing XML on the fly will be relatively straightforward, although effort will need to be devoted to creating appropriate document type definitions.

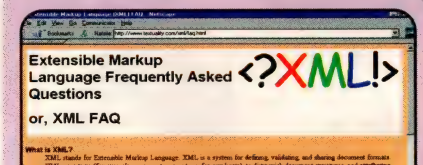
If XML succeeds in allowing authors to create more efficient data structures, and garners the support of specific interest groups, then it will likely assume its intended place as a mass-market SGML designed to create more efficient interaction with online data. If, however, browser vendors convince the majority of users (and authors) that proprietary systems offer greater flexibility and cheaper implementation, then XML may become little more than an academic curiosity. Even in that scenario, organisations that have already invested heavily in SGML-compliant systems will likely migrate to the online-friendly and more efficient XML. Time will be the ultimate arbiter.■

Online resources

Learning more about XML

Reflecting its origin in a highly-connected world, nearly everything you might ever want to know about XML can be found somewhere online. If you're feeling especially brave (or SGML-savvy), you might want to dive straight into the current version of the XML specification, which is located at http://www.w3.org/TR/WD-xml-lang. This is, however, heavy going, especially if you are not technically minded and have no taste for the finer points of basic XML syntax.

A better starting point may be the XML FAQ (http://www.ucc.ie/xml/), which includes sections aimed at users, authors and developers, and offers a reasonable level of detail. This is also available in a condensed version, at http://www.textuality.com/xml/faq.html, which offers a much more 'bare-bones' approach.



There are also other useful documents and sample applications scattered around the Web (many of them mentioned in the FAQ). Robin Cover's XML page (http://www.sil.org/sgml/xml.html) includes the most thorough list of XML references that we are aware of, with numerous links to companies planning to adopt it as a standard and details of current XML projects.

XML, Java, and the future of the Web, a paper by Jon Bosak of Sun Microsystems (who is the chair of the W3C SGML working group), provides an interesting discussion on how Java processing capabilities might interoperate with XML documents, and is located at http://sunsite.unc.edu/pub/sun-info/standards/xml/why/xmlapps.htm.

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With a multitude of high-bandwidth solutions available, old-fashioned copper twisted pair seems to have a limited lifespan. But a range of new digital subscriber line technologies are breathing new life into the copper network. **By Grahame Lynch**

DSL joins the broadband race

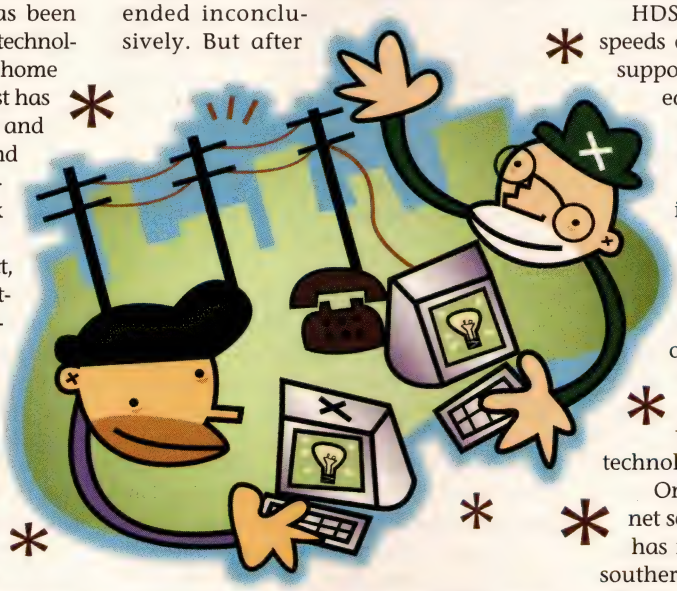
DSL technologies take two major forms: asymmetric digital subscriber line (ADSL) technology and high data rate subscriber line (HDSL) technology. ADSL has been touted for some years as a potential technology for delivering broadband to the home over existing copper lines. But its cost has made it prohibitive until recently and many carriers, including Telstra and Optus, have opted for other technologies such as hybrid fibre-coax instead.

HDSL is a more obscure product, used mainly to link local area networks together into wide area networks while avoiding the high costs of digital leased lines and the poor latency rates of conventional switched telecommunications. It is now beginning to take off, as the end of the Australian carrier duopoly allows third parties to set up their own links. The impetus for DSL came in the US where established local access carriers have been seeking technologies which allow them to compete against the cable data and telephony services that are being introduced over hybrid fibre coaxial networks. The US carriers wanted to introduce broadband services that leveraged their existing multibillion-dollar investments in copper twisted pair networks.

Test results for ADSL prove the potential worth of the technology, with speeds as high as 8Mbps being achieved. Even in its common form of 1.55Mbps, ADSL is still considerably more attractive than standard analog modems (28.8Kbps to 56Kbps) and ISDN (64Kbps to 128Kbps). However, despite widespread predictions that ADSL would take off in 1997, this has not been the case. Most planned commercial services are still in trial phase.

There are a number of reasons for this. Firstly, the cost of ADSL modems is still too high. At best, modems cost about $2,000, which is at least three times the price that many carriers believe is necessary to make the service economical. Secondly, carriers are wary of repeating the mistakes made with ISDN where they jumped in early and failed to understand how to market it effectively.

Telstra began trialling ADSL services in Melbourne during 1994 using NEC as its main integrator. The trial was subject to a timetable blowout and appeared to have ended inconclusively. But after backing ISDN and cable modems in the marketplace, Telstra now appears to have returned to embrace ADSL. CEO Frank Blount told *APC* in Singapore in June that the cost of DSL technologies had fallen to the level where they could now be viably considered for deployment. Describing it as a "realistic option", Blount said that ADSL was an attractive choice where overall broadband penetration fell below 30% of households. Above 30%, hybrid fibre-coax was a better option, he said.



One restriction on ADSL is that it only works properly within 3.2km of an exchange. Blount thought that about 75% to 80% of all telephone lines in Australia fell into this range. With Telstra's hybrid fibre-coax network passing only about one-third of Australian homes, ADSL could prove to be the technology of choice for the remainder.

A new backbone?

Unlike ADSL, which essentially operates in the customer access network, HDSL is emerging as a useful technology for new carriage service providers or wide area network operators who want to bypass the expense and delays associated with carrier digital data products. In this sense, it is a backbone technology.

HDSL, like ADSL, operates at high speeds over copper lines. However, HDSL supports symmetric speeds of 1.55Mbps each way. ADSL is asymmetric, supporting high-speed download and relatively limited upstream speeds.

HDSL has been virtually nonexistent in Australia until recently, mainly as a result of the carriers duopoly which gave Telstra and Optus exclusive rights to operate any telecommunications link over 500m in length. But the end of the duopoly on July 1 has given other carriage service providers the opportunity to make use of this technology.

One such player is Sydney-based Internet service provider Magna Data, which has installed an HDSL link between its southern CBD premises and a 36-storey office building in the city's financial district. According to Magna Data director Luke Carruthers, the use of HDSL has allowed the company to provide a cheaper and faster service than would have been achieved by ISDN, which until now has been the favoured access medium for corporate data communications in Australia.

Carruthers said that HDSL is much more attractive than the broadly equivalent Digital Data Service range of products offered by Telstra and Optus because it is much cheaper. "HDSL removes bandwidth as a limiting factor," he said. "You can't value-add or customise ISDN or Digital Data Services because they are end products in their own right."

Magna Data provides tenants in the Castlereagh Street building with a range of scalable online and Internet access services, including a facility to alter their office lighting and airconditioning through the World Wide Web.

One of the selling points of the service is the ease of product connection. Carruthers promised that services can be provided to building tenants within three days of the request, considerably faster than the weeks and sometimes months

quoted for Telstra ISDN installations. Once the product is up and running, Carruthers said that the increased speed and improved latency (delay) add considerably to user satisfaction with the service.

"Latency rates are crucial to Internet traffic," said Carruthers. "With HTTP there are lots of communications back and forth between the server and the user and it can take 15 transactions to get a Web page downloaded. Now we've found that HDSL has a 2 to 3ms latency. This compares very favourably to Digital Data Services at 8 to 10ms, ISDN at 30 to 35ms and standard 28.8Kbps modems at 150ms.

"With HDSL, we've found that you get a 30 times better performance than ISDN for about the same cost," said Carruthers.

Magna Data's favourable view of HDSL is echoed by another carriage service provider, Paktel, which specialises in communications outsourcing, providing wide area network communications to Australian and other multinational mining companies with operations in Indonesia.

According to spokesperson Jeremy Grigg, Paktel's customers use a number of communications technologies such as very small aperture terminals (satellites) and microwave links to connect their operations, but have found that HDSL is a superior alternative to other fixed-link technologies.

"We've found that HDSL works best where a network requirement is greater than can be achieved through standard public network services but not big enough to justify the complete overhaul and installation of new equipment," said Grigg. One HDSL application used by a Paktel client involves extending the core high-bandwidth communications link of a major mining operation to incorporate an adjacent residential compound where onsite workers live. This allows the workers, who are usually far removed from standard communications services, access back to their families.

Another application by a mining company links two of its PABXes with an HDSL connection, allowing an expansion in network capacity not usually possible because of the absence of ISDN service in the geographic area where the operations are located.

Like Magna Data, Paktel has found that HDSL is considerably cheaper than and/or superior to ISDN or Digital Data Service technologies. "It is clearly the better product in its price range," said Grigg.

Where do you get it?

The problem for anyone planning to deploy DSL technologies is the scarcity of vendors. Carruthers said that he is aware of only one company providing an HDSL solution: Pair Gain Technologies of the US. Grigg said that Paktel sources its HDSL gear from California Solution Networks Corporation, which is not believed to have any Australian representation.

The situation is only slightly better for ADSL technologies. A diverse number of companies are working on various components of ADSL solutions, especially the much prized DSLAM technology which connects Ethernet to ADSL systems.

Only a few companies claim to provide complete solutions. One notable example is Alcatel, which cut a lonely figure at an International Telecommunications Union exhibition in Singapore last June pushing its ADSL product in a sea of mobile phone, satellite and Internet offerings.

The future of HDSL and related backbone technologies such as RADSL (rate-adaptive) and VDSL (very fast) depends on the success of ADSL, which is best described as the mass-market retail product of the grouping. Magna Data's Carruthers said HDSL would never have become a viable option if "ADSL hadn't captured everyone's imagination and dragged other DSL technologies with it".

ADSL has visibly failed to deliver on its early promise and even as its cost comes down, there is still concern about the lack of an agreed standard for the technology. Like the battle between VHS and Beta in videocassette recorders and, more recently, the standards tussle over 56Kbps modems, ADSL buyers face a choice between two rival standards and the possibility of backing the eventual loser. One of the problems is that the clearly superior standard is coming second — and last — onto the market.

The DMT standard developed by US firm Amati Communications operates at a higher speed than the rival CAP standard developed by AT&T offshoot GlobeSpan Technologies, about 6Mbps versus 1.5Mbps.

Technical observers also rate DMT highly on its various operational attributes, including its ability to vary its data rate depending on the quality of the given phone line. DMT is also supported by more chip manufacturers, including heavyweights such as Motorola and Texas Instruments.

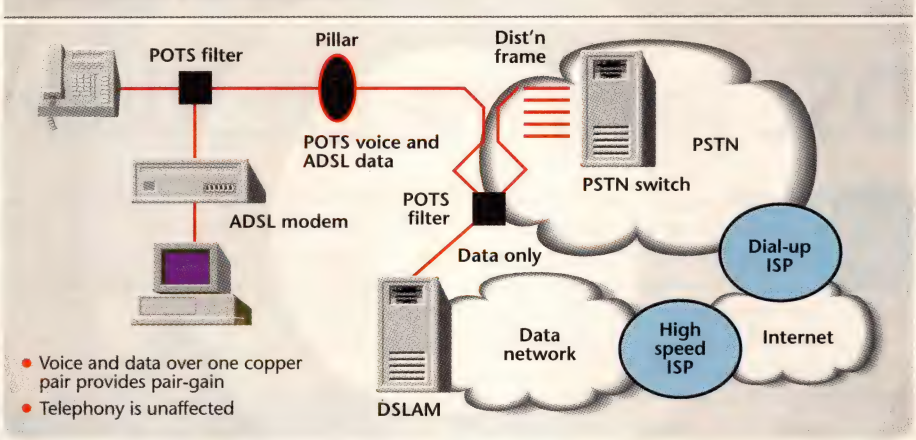
However, CAP products are already commercial and are offered through Lucent Technologies, which is one of the world's largest telecommunications manufacturers. Carriers, and potential ADSL customers, have been loath to commit to one standard or the other until signs of a clear winner emerge.

That said, carriers such as Telstra are beginning to see the error of their ways in committing to risky broadband options such as hybrid fibre-coax or switched digital networks.

Some HFC operators have experienced difficulty in even getting their networks to make the phone ring. And as cable modem deployment increases on HFC networks, many operators fear that they have no real idea how traffic flows will conform to the expectations set when the networks were built. While DSL technologies have some uncertainty, many telcos are starting to believe that their ability to leverage existing infrastructure and dedicated bandwidth (as opposed to the shared bandwidth of HFC) makes them a more predictable network investment.

Australia may get universal broadband coverage, but we may still divide into a band of haves and have nots: those who gain the reliable broadband speeds of ADSL, and those who take the risk of variable bandwidth and the network brownouts of HFC.■

ADSL in the network



Is it possible to develop a comprehensive Internet business solution using tools from just one company?

By Angus Kidman

Untangling the Net

The World Wide Web is actually more like a worldwide patchwork. It links together numerous networks and systems running on diverse platforms that previously wouldn't have talked to each other without the electronic equivalent of the United Nations to broker the conversation. This ability to incorporate diverse technology solutions is one of the key reasons for the Web's success in both business and consumer markets — it flattens out both platform and vendor dependence.

Such an approach marks a significant departure from the manner in which vendors have traditionally sold software. While 'best of breed' has often been the catchcry from IT managers, software companies see a greater potential for profit if they can convince buyers that the simplest solution is to buy everything from a single vendor (the 'one-stop shop' approach). Sometimes this strategy can be highly successful; integrated suites have all but killed off the individual application, for instance.

The Web represents a tougher nut to crack. Not only has it been largely built on at least partially open standards, but the creation of intranet and extranet solutions almost invariably involve the integration of technologies from multiple vendors. On the other hand, the sheer size of the market (Forrester Research predicts that Internet commerce tools alone will be a $US3.2 billion market by 2000) is a powerful incentive for software companies to pursue the goal with vigour.

Software vendors have thus been busy building up an arsenal of tools (via development and acquisition) to convince users that they can meet all their Internet, intranet and extranet needs. But have they achieved that goal?

A closer look

APC decided to find out how easily a medium-sized business would be able to implement an Internet/intranet solution using technologies from three leading vendors in this area: Lotus, Microsoft and Netscape. Rather than discussing their offerings in an abstract context, we created a fictitious company that was looking to build a new Internet/intranet presence, and then examined how it might achieve that in a single-vendor framework.

Obviously, the three technology firms we selected were not the only candidates for a single-vendor solution. Indeed, one of the most important conclusions we reached during this study was that virtually no-one can truly claim to offer a totally comprehensive solution in this way. On pages 140 and 144, David Braue and Josh Gliddon examine technologies from other leading vendors, specifically in the database and communications services areas, that could assist our sample company to reach its corporate technology goals. To add a dose of reality to the proceedings, we've also included case studies from three Australian companies that chose to implement network solutions from our three focus vendors.

Welcome to Salami Enterprises

For the purposes of this review, we created a fictitious company, Salami Enterprises, which focuses on selling gourmet small goods to the catering community. A leader in its field, Salami Enterprises has approximately 40 full-time staff (plus many contractors). The core staff members include:

- A management and sales team of eight, most of whom travel frequently. Two of these staff members are equipped with Pentium 60 notebooks (each running Windows 95, with 16M of RAM and a PCMCIA NIC/modem card). The other six staff are essentially PC-phobic at this juncture.
- Five support staff work in the company head office in Sydney. Each staff member has a Pentium 60 Windows 95 PC with 16M of RAM. The company runs cc:Mail

on a NetWare 3.11 network, controlled by a single Pentium 60MHz server with 32M of RAM. The main company goods-tracking system, which was written in dBASE by a contractor over 10 years ago, also resides on this server and is directly accessible by staff in the main office, who are responsible for its upkeep.

- Ten support staff in the main Sydney warehouse (which is located three blocks away from head office). The warehouse staff have access to three Windows 3.1 PCs (each equipped with 8M of RAM and running on a 486 DX2/66 processor). These PCs are connected via a direct dial modem into cc:Mail, but not to the company database. cc:Mail is used to email order details to the central Sydney office, although this process is not automated in any meaningful way.
- 15 support staff are spread across smaller warehouses in Melbourne, Adelaide, the Gold Coast and Hobart. These warehouses have no PC technology; they fax details of orders to the Sydney office, which enters them into the system directly.

The company also uses an external marketing agency that runs a totally Macintosh environment, which has proved to be a barrier to meaningful electronic connectivity in the past.

(An historical note: Salami Enterprises has a relatively developed email infrastructure because of a consultancy report written four years ago which recommended email as "the way of the future". The managing director is keen to see this structure maintained, although he recognises that it could be used more efficiently).

Salami Enterprises is looking to install a cross-company intranet/Internet system to improve company processes and performance. The company is looking for features including:

- email connecting the entire company, to improve communication between divisions;
- the ability for employees at remote sites to update company database information via custom email forms, eliminating the need for data to be retyped, and minimising training required at branch offices. (Employees in Sydney are expected to be able to enter data directly into the relevant database if required);
- a public company Web site, promoting Salami's goods and services. The initial content will be developed in partnership with the marketing agency, after which maintenance will be the responsibility of the company or a contractor. Part of this site will be an 'extranet' which allows clients to check the status of their orders. Further down the track (perhaps 18 months away), the company would like customers to be able to place orders online through a secure browser client. The company has no special preference whether an internal server is used for this project, or if some or all data is hosted externally.

We are not aiming to provide a complete and detailed budget, but we do want to give some indication of where the main areas of cost might be.

The budget for the project is not fixed, but clearly needs to be kept as low as possible. The company's administration manager does not object to replacing some elements of the existing system or introducing extra hardware where necessary, but is opposed to doing a complete 'rip and replace' of everything that is in place unless it is essential. The managing director is not keen to put a PC on every desktop, but recognises that at the bare minimum a PC will be needed in each branch office, and that the server will need to be replaced and upgraded with an ISDN connection.

With these conditions in mind, we examined how Salami Enterprises might implement a solution from Lotus, Microsoft and Netscape. Factors we considered included cost of development, cost of implementation (including hardware and training costs), ease of integration, future-proofing of systems, total cost of ownership, and ability to interact with external systems. Our aim was not to provide a complete and detailed budget, but to give some indication of where the main areas of cost might be.

Clearly, some aspects of all three solutions will be identical. Regardless of the platform chosen, the company will need to purchase new PCs for its branch offices, possibly add extra notebooks for the management team, select an Internet service provider for online services, and contract a development group to create interfaces between its intranet and existing databases. While these aspects will also be discussed in the reviews that follow, our focus is on the benefits and drawbacks of choosing a single-vendor solution.

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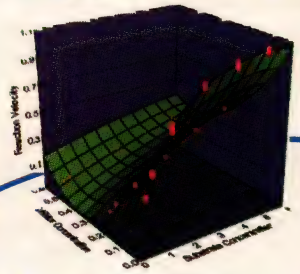
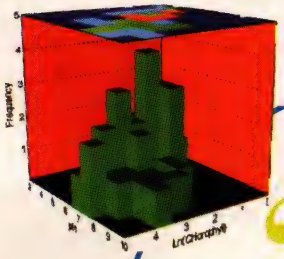


Joint Distribution of pH and Chlorophyll



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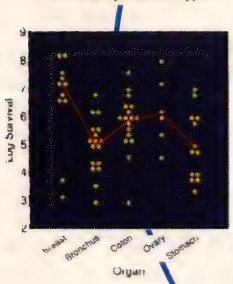

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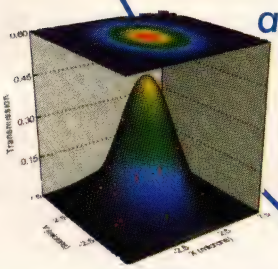

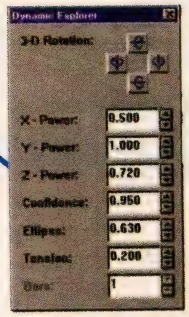

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Lotus

There are a number of alternatives available to Salami Enterprises using Lotus software. All revolve around the use of the Domino server platform, with the dBASE database either connected to the server platform or moved entirely to Domino.

Domino offers a mature environment in which to develop groupware, Internet, intranet and extranet solutions. Internet standards-based applications such as browsers and email software can be used to access the servers. Or additional client functionality can be achieved via the Notes client, currently available on a number of platforms including OS/2, Macintosh, various versions of UNIX, and Windows 3.1, 95 and NT.

Given this platform and standards flexibility, the solution designer can create a Domino/Notes installation with minimal changes to existing hardware, software or communications capabilities.

Lotus's support of open systems suggests likely future-proofing of the solution. Existing and expected future support by the software company of open transport protocols and e-commerce capabilities should eliminate the requirement of users of the technology to change the underlying Domino-based solution. This allows the designer of the Notes solution to use the existing hardware and operating system software investment, while moving the organisation towards a more open communication path.

Stepping stones

Alternatives are possible to avoid the expense of a server, network or communications upgrade.

The solution can be achieved with the organisation's current IT environment. Additional hardware would only be required in the remote warehouse sites currently using a combination of fax communications, with stock data entry performed at the company head office.

Until permanent links are established to all sections of the organisation, Domino replication facilities can be used. The original dBASE database connects to the Notes database using Notes Pump. This provides bi-directional interaction with existing databases and Notes. Notes Pump actually copies all data from dBASE to a Notes database and keeps the two databases synchronised.

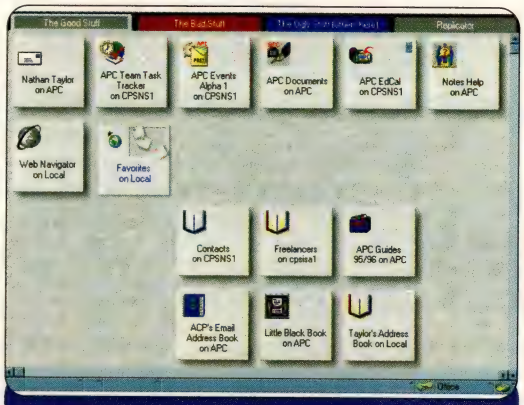
If no users intend to access the dBASE database directly, dBASE can be dispensed with to remove unnecessary copies of data. If the dBASE solution still must be accessed, Notes Pump can be kept in place. While this is not as clean an implementation as directly accessing the data in the original database, it does allow the replication services of Notes to be harnessed. If large amounts of data are involved, moving the database to a separate database server is advisable.

Configuration within the existing framework

The Lotus Domino server provides a combination of groupware and messaging based around the concept of databases. While Domino servers in their early incarnations were not designed as Internet tools, Lotus has added Internet standards-based communications capabilities.

The current release of the Domino server — available for NetWare, Windows NT, OS/2, IBM AIX, HP-UX and Sun Solaris — supports major Internet standards. This allows a large portion of the functionality once only accessible by the Notes client software to be accessed by users equipped with a compliant standards-based browser and client software.

It is possible to use the existing IT structure of Salami Enterprises to achieve the solution required. A Domino server, running on the existing 32M Pentium 60 NetWare 3.11 server in the corporation's head office and connected to the existing dBASE database, can provide connectivity to all existing clients without any hardware changes and with all clients running the Notes client software. This client application provides connection to both databases and the Notes messaging system, as well as offering the capability to add functionality not easily available in browsers.



The Notes client.

Head office clients can use the existing network, Ethernet with IPX, to connect to the server. Clients in the main warehouse and the remote, notebook-using staff connect directly to the server via their existing dial-up modem connections — the Notes client software can be scheduled to regularly replicate databases. PCs will have to be purchased for the remote warehouses. These will connect to the central server in the same manner as the client and remote sales and management team.

The external marketing company can be given access to the system via Notes client software running on Mac OS connecting to the system in the same dial-up manner. Alternatively, if the external marketing company has Internet email, Salami can set up a Notes-to-Internet mail system. This can be achieved by a connection to a service provider that offers Notes to SMTP connectivity or by setting up a Notes-to-SMTP gateway.

If the modems are managed carefully, the whole system may function using only two or three modems on the server.

Notes, NetWare and IP

While it is possible to implement an almost complete solution by using Domino on the existing network setup, moving the organisation to an IP-based Internet-connected network can provide a number of advantages.

Clients can connect to servers using Internet standards-based applications including browsers and mail clients, permitting the use of 'lighter' hardware.

A greater emphasis on the Internet as the communications channel gives rise to the potential to save money on phone calls by greater use of email and by remote clients connecting to the central server across the Internet. Less tangible advantages of moving to IP include staff readiness for Internet-based trading and communication.

Moving to IP with Salami's existing base of hardware and software is not overly difficult. However, the advantage of making the move is only realised by the installation of a permanent link to the Internet — preferably a digital link such as ISDN or Frame Relay.

Assuming the addition of an Internet link is made (remember to factor in the cost of additional routing hardware and security requirements), remote warehouse clients can connect via their local ISP to

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❒ MIS Manager
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❒ Project Manager/Group Leader
❒ Engineer/Architect
❒ Accountant/Finance Officer
❒ Systems Analyst/Program Analyst
❒ Other computer department
❒ Consultant/Adviser
❒ Sales Representative
❒ Other Professional
❒ Office Administrator
❒ Educator ❒ Student
❒ Other (please specify)

2. What is your organisation's primary business activity?
❒ Government, utilities
❒ Agriculture, mining, oil
❒ Computer manufacturer/distributor
❒ Transport
❒ Construction
❒ Communications
❒ Finance, banking, insurance
❒ Research and development
❒ Engineering architecture
❒ Manufacturing (non-computer)
❒ Retail (non-computer)
❒ Publishing, media
❒ Health
❒ Legal
❒ Armed forces
❒ Computer retailer/reseller/consultant
❒ Other (please specify)

3. How much IT equipment do you anticipate being involved with the purchase of during the next 12 months at work? (Please include all hardware, software, peripherals, connectivity equipment and consumables.)
❒ None
❒ $1 - $999
❒ $1,000 - $4,999
❒ $5,000 - $9,999
❒ $10, 000 - $49,999
❒ $50,000 - $99,999
❒ $100,000 - $249,999
❒ $250,000 - $499,999
❒ $500,000 - $999,999
❒ $1,000,000 +

4. How many microcomputers are you directly responsible for at work?
❒ 1 - 9
❒ 10 - 19
❒ 20 - 49
❒ 50 - 90
❒ 100 - 499
❒ 500 - 999
❒ 1,000 - 1,999
❒ 2,000 - 4,999
❒ 5,000+

Thank you for your assistance.

97APSP

the Domino server for database replication. The Salami Web can also then be hosted by the organisation on the existing Domino server.

Of course, to achieve these end goals NetWare 3.11 must be configured to support TCP/IP as well as IPX. NetWare 3.11 includes TCP/IP capabilities in the base NOS — the administrator must load the appropriate NLMs, provide addressing information and bind TCP/IP to the NIC in addition to IPX. Using both IPX and TCP/IP allows the office machines to continue to access the file and print services of the existing NetWare server or the Domino server through the Notes client. Disruption in the workplace is also minimised. An alternative is to upgrade the NetWare server to IntranetWare or IntranetWare for Small Business; the existing hardware will support it and TCP/IP can be used as the native protocol. A further alternative is to install the Domino services on a separate application server — NetWare, Windows NT, Unix or OS/2 — with TCP/IP support.

Moving the clients to TCP/IP is not necessary but, according to Lotus, it does improve performance between the Notes client and the server. In addition, this gives the administrator the choice of running Notes clients or browser software.

It is not necessary to connect the warehouse to the servers via TCP/IP. A direct-dial local connection to the server is a cheaper alternative than connecting via an ISP. This also obviates the need to add a TCP/IP stack to the three Windows 3.x boxes.

Web site

While the complete Notes client/Domino solution as discussed meets the needs of the company internally, it does not provide a public Web site with marketing and client order-status information.

Using Domino, the solution can be built to include a public Web site with these capabilities. The externally located marketing agency can work with a Web/Domino developer to create a site that permits content update by Salami staff without the need to learn HTML, and with workflow capabilities built in. In addition, the marketing company can use the workflow capabilities they build into the site to have sign-off on material as well the ability to add their own material. For the external marketing agency this can be done through a Notes client connected to their Macintosh or through a Web browser.

If the organisation doesn't wish to move to an IP server environment, the Notes database could be hosted at an ISP that offers Domino support. The public would then access this database through the Web. Salami and the external marketing agency would keep this database up to date via replication. This design also provides Web server redundancy and places the responsibility on the ISP for maintenance.

If Salami decides to install a permanent link, the Domino server used for the main work practices could be used for Web serving, although — depending on the tolerance for server downtime — the company may wish to investigate the addition of fault tolerance.

Pros and cons

Lotus's products can provide a neat solution to Salami's requirements with minimal disruption to existing systems, and support for future growth. As the company grows and makes greater use of technology, the organisation's sites can be connected together either via a WAN or Virtual Private Network (VPN). This will allow live access to systems as well as the potential to use services such as videoconferencing. Ideally, the next big step for Salami is to provide a secure online ordering service using Domino.Merchant, and provide greater extranet access for the company's partners.

Ben Gerholt

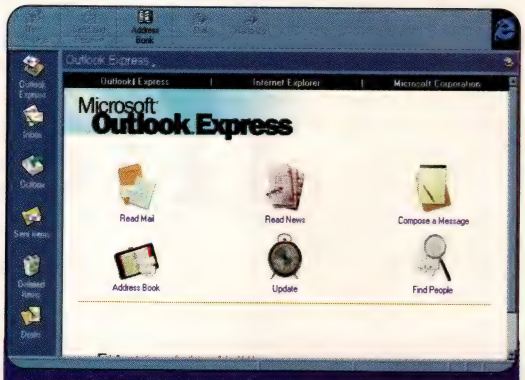
Microsoft

For Microsoft, the solution to Salami Enterprise's predicament comes not so much from one product as a number of products with ActiveX acting as the glue binding them together.

As might be expected with a Microsoft solution, the move to Windows NT Server is essential, preferably with a period of coexistence with the NetWare server. While this would require an additional server, it would save the support staff the pain of a 'rip and replace' upgrade of the server, and would spare the company server downtime as the operating system was replaced.

The NT server would run Services for NetWare to provide interoperability between the servers, while services and users were migrated across to the new NT server. Once all the services and clients had moved across, the NetWare server could be retired. Alternatively, the NetWare server could continue to be used as a file and print server, sparing the NT server these tasks and providing an extra level of fault tolerance, although this would require management.

It would be advantageous, but not essential, to install Microsoft's Systems Management Server (SMS) to manage and inventory clients. It could be used in the migration of the clients by distributing software 'packages' to the requisite clients, and remote systems administrators (either Salami staff or consultants) could use SMS's remote control, network diagnostics and inventory tools to manage the clients on Salami's about-to-be-created intranet.



Outlook Express: Microsoft's mail client of choice.

Email and groupware capabilities would be eventually provided by Exchange Server 5.0, although its cc:Mail connector would allow the continued use of cc:Mail until the NetWare server was retired. Internet Information Server (IIS) 3 (or the upcoming Version 4) would be used to provide HTTP and, if required, FTP server capabilities.

Instead of faxing orders to the head office, Salami could use email or HTML forms on an intranet server. Using email forms, a server-side process can accept mail sent to its address, extract the contents and insert it into the database. Alternately, VB Script or J Script on an Active Server could be used to update the database, allowing staff members to enter transaction details into fields on an HTML page.

Active Server Pages, a component in Microsoft's OLE strategy, act as a kind of go-between between server components and HTTP clients (Web browsers). Using ActiveX components at the server end to access various data forms, Active Server Pages provide a means for Web clients to dynamically access databases and other information sources. By the same means, customers can query the database

regarding the status of their orders, and later, to make orders online. Any browser can open and use an Active Server page, although obviously Microsoft would like the clients to use Internet Explorer 3.02 (or 4 when it is in final release).

Microsoft offers several means of accessing the database. One is to migrate the database to BackOffice's SQL Server. This may require a painful transition process (converting the database would be easy, but the transition may force a significant change in work and management practices), but it would provide a highly scalable solution for the long term, along with a large number of tools for managing the database.

Another solution would be to use Microsoft's Visual FoxPro, which can run dBASE applications natively. This would spare Salami Enterprises the shift in business logic required to move to SQL and allow the dBASE store to be used as a database server. The main advantage of this is that it would make a previously inaccessible dBASE store ODBC compliant. Using ActiveX, the contents of that database could be exposed to a variety of applications — including Web applications. In addition to these advantages, using Visual FoxPro to develop applications to access the dBASE store would save Salami the expensive licensing agreements associated with SQL Server 6.5 (although the development costs may make up for this).

Moving to an SQL or FoxPro solution should make updating the database via email relatively easy. Email forms, implemented in Exchange 5.0, could be filtered using ActiveX and inserted into the appropriate fields in the database. Microsoft's Outlook is especially appropriate for this task, as each field in an Outlook form is treated as a different ActiveX property, and can thus be made to correspond to fields in the database.

By the same token, HTML forms could also be filtered into the database, either through Exchange (which has the ability to provide email services through HTML forms), or directly. The former is most useful if there is no permanent connection between offices. Alternatively, SQL commands written into the email form can be directly extracted and applied to the database.

Creating the Web site would be done in Visual InterDev and FrontPage. FrontPage would provide the site-creation and management facilities, while InterDev would provide a means of producing the required applications for both entering and extracting data from the now ODBC-compliant database. Using InterDev, the Active Server Pages required for customer account enquiries would be built, and Web pages using data from an external data source (such as price lists) can be generated dynamically.

Getting the marketing agency involved would require the loading of Macintosh Services for NT Server and installing FrontPage for Macintosh on the marketing agency's computers.

IIS already supports SSL transactions over the Internet, so arranging online orders should not be a problem. A better solution would be to use the Enterprise Edition of Microsoft's new Site Server product, which has advanced E-Commerce capabilities. The non-enterprise edition of Site Server could also be used in the interim to help manage the Web site. It can report site-use statistics, and provide site maps and personalisation tools.

Interconnectivity between locations would be achieved using Microsoft's recently released Routing and Remote Access Service (formerly known as Steelhead), which can be downloaded for free from Microsoft's Web site. This would be used to create a virtual private network on the Internet.

Each remote warehouse would dial into an ISP using a modem line and would use point-to-point tunnelling protocol (PPTP) to provide security for data transactions over the Internet. PPTP also allows the routing of IPX packets over IP for access to the NetWare server. The connections could be dedicated or periodic, the former useful for immediate transfer of files, while the latter can save money on ISP charges and server-end modems and phone lines. If periodically scheduled dial-ins are used, then the most practical means of transmitting data to the database is via email.

The Sydney warehouse could either use an ISP or dial in directly, which would require extra modems at the server end as well as additional serial ports on the NT server. Routing and Remote Access Service also provide the means for employees to dial in and work from home or on the road if required. This last service would require additional phone lines and modems at the server and client ends.

To use these services, along with HTTP and Exchange email, would require that all the clients on the network have TCP/IP stacks. The NT server itself would also require a high bandwidth, permanent connection to the Internet, such as an ISDN, DDS or frame relay connection to a major ISP.

Given this solution, new hardware will be required by Salami to the tune of one

server (for Windows NT) and three PCs (one for each of the remote warehouses). Also recommended (but not required) is a memory upgrade on Windows 3.11 machines and a move to Windows 95 (which would solve some of the problems with using TCP/IP on Windows 3.1). Where PCs are shared, the User Profile capabilities of Windows 95 and NT will allow multiple users to log on separately and have their own configuration.

Pros and cons

It is clear from the outset that Microsoft's solution is not as simple or elegant as either of the two other solutions. For Microsoft, there is no single product to take care of all the company's needs. Separate products exist for Web serving, email, database connectivity, Internet tunnelling, site development and management and these products don't always sit comfortably with each other.

Any project based purely on Microsoft products is bound to require a mass of different applications. Quite often they will require an 'extra layer' (such as ActiveX) to cooperate, which can make the resulting solution look very messy. This sits in stark contrast to a solution like the one provided by Lotus, in which the email, HTTP, databasing and development tools are all provided in the one package.

The Microsoft option does not provide a cheap solution, or one that's easily managed. Licensing, for a start, is going to be a difficult prospect. Under the proposed solution, the network administrator would have to manage licences for at least three and possibly four (if SQL server is used) products. And while the client software (Internet Explorer and Microsoft Outlook) is actually free, the server components can be a bit pricey.

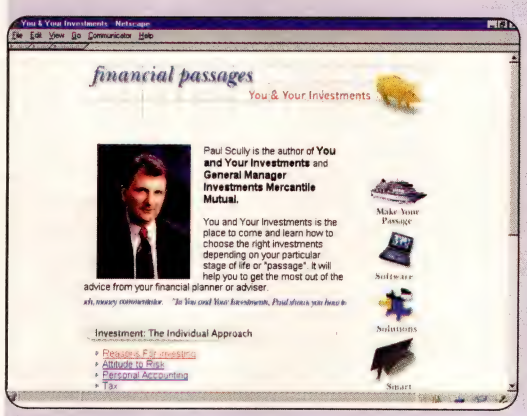
On the upside, however, the Microsoft solution is definitely not lacking in functionality. A suite of Microsoft products can do pretty much what any other single vendor can do. The large variety of products provided by Microsoft covers just about every conceivable need of the company, and through Microsoft's ActiveX technology, these products can be made to communicate with each other.

Given the vast amount of Windows NT development underway both at Microsoft and by third-party developers, a Microsoft house will never be short of new products or development tools with which to upgrade its network.

Nathan Taylor

Financial Passages

Built using Microsoft technology, Mercantile Mutual's Financial Passages differentiates itself from other personal financial sites through its focus on becoming an online financial resource for its readers, according to Steve Langsford, Mercantile Mutual marketing manager. "We don't take advertising, but we do put together packages to help our readers get online. If they don't have a computer, we have arrangements with Harris Technology, and if they need to get online, we also have arrangements with OzEmail," he said.



Financial Passages originated as a book written by Paul Scully which has sold around 200,000 copies since its launch in 1994. Mercantile Mutual took over the book and launched the site in 1995.

Langsford said that, along with providing a service to its users, the site, developed by Spike, also serves to tie visitors in to Mercantile Mutual and to get them used to dealing online with the company. One thing the site won't become is an extension of existing company sites, Langsford stressed. "We're not ruling out adding transaction services in the future, but Financial Passages will always exist apart from [any future] MM business site."

Spike's principal creative director Chris O'Hanlon said that while it's important to maintain the separateness of Web sites, it is equally important to tie a Web strategy into an organisation's overall information technology strategy. "The days of sites simply being marketing exercises are over. Companies need to consider how the Internet and related technologies can be integrated into the company as a whole." The ultimate goal, he said, is to empower workers through information access. "It's taking information to the lowest common denominator."

Financial Passages is powered by Microsoft NT SQL, which O'Hanlon said is increasingly becoming the technology of choice for many of Spike's Web sites. "We develop using both Unix and NT, but we're seeing more and more people opting for NT, either because they want their Web strategy to integrate with internal systems, or simply because Microsoft is perceived by them as the only solution."

NT is also the choice in terms of cost, said O'Hanlon. "We're looking for solutions that work straight out of the box, that don't require further development and can use relatively inexpensive hardware."

To this end Spike has formed relationships with Hewlett-Packard and Verifone to offer cheap, transaction-capable systems to Spike clients. "The cost of putting up a site and then maintaining it over time is growing, so if we can say 'here's a UNIX solution and you'll need to buy a Sun or SGI box and altogether it will cost x dollars, and then we offer them a cheaper solution using NT and commodity hardware, they'll go for it."

NT faces criticism for its lack of track record in reliable enterprise applications, but O'Hanlon said it is "just a matter of time" until NT has "proved itself in the same way that UNIX has".

"For transaction systems, it's just a matter of waiting and seeing how things pan out. UNIX has well-proven strengths, and it's more a matter of just riding the learning curve with NT to see how it fares over time," he said.

Financial Passages is at http://www.financialpassages.com.au.

Josh Gliddon

Netscape

After recent simplifications to its product line, Netscape has a very straightforward story to tell its enterprise users: install an appropriate version of SuiteSpot from the three on offer, distribute Communicator clients to all your users, and then develop specific application components with a mix of HTML, Java and JavaScript. While this would be the core solution for an all-Netscape solution at Salami Enterprises, the reality would be a little more complicated.

MicroGram Computers

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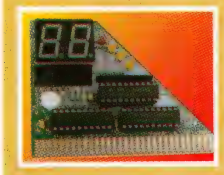

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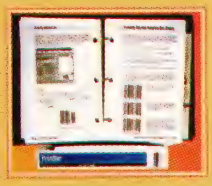

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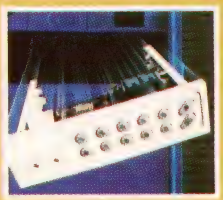

No software required. A small keypad mounts in a 3.5in bay which allows an access code to be entered. Two access codes distinguish the level of user. The floppy drive is automatically locked when accessed by the second user. Keyboard & mouse may be locked/unlocked at any time.

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Cat. No. 11272	**Ethernet 8/16 Bit BNC/UTP PnP Jmp**	$71

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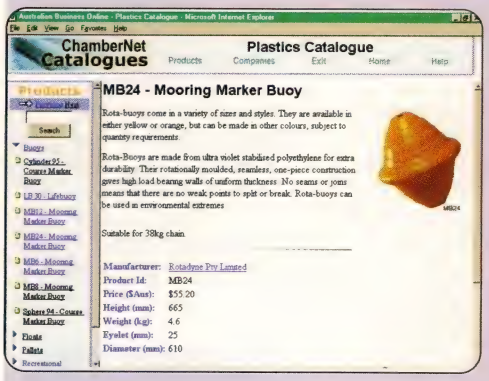
Australian Business On-line

Sydney organisation Australian Business On-line (ABOL) has used Lotus Domino to develop a Web-based publishing and electronic-commerce infrastructure for its 3,700 member companies and affiliated organisations.

ABOL, a subsidiary of Australian Business Limited (previously the Chamber of Manufacturers of NSW), developed two Web-based information-exchange systems based on Domino: the TradeHub electronic-commerce initiative and ChamberNet, a collaborative publishing system that lets companies share their expertise on ABOL's Web site (http://www.abol.net). By



involving industry players and Chambers of Commerce in other states, said technical director Yuval Pilavsky, ABOL hopes "to be a one-stop shop for business-related information repositories".

TradeHub, explained Pilavsky, is designed to introduce small and medium-sized enterprises to Web-based electronic commerce. "It's for companies with perhaps 100 products and simple pricing structures, who want a presence on the Internet and understand that a simple home page doesn't do them justice or bring in business," he said. "We bundle a catalogue presence and home page into a standard environment and let people control their own content so they can project their unique identity and participate in a much larger transaction space."

Using a Web browser, members log onto ABOL's Notes database and enter information about the products they offer. ABOL maintains the list of participating companies in Notes' address book, and Domino handles password access to individual company pages. The system then uses entered data to generate customised home pages incorporating a standard online-shopping interface.

When visitors want to purchase a product, they enter their details, which Domino relays to the Notes server. TradeHub then automatically sends the vendor an email containing the details of the order. Member companies can also use a Notes client to replicate customer orders with original formatting intact.

ABOL's other Domino application, ChamberNet, lets companies easily publish industry-related resources they have written (for example, Australian Business Limited currently offers a guide to managing supply-chain logistics). Submissions are formatted to match style guidelines and published to the Web site using Domino.

By allowing contributors to be directly involved with the content creation, ABOL content editor Darren Horrigan said Notes has removed technology barriers that often keep people from sharing their knowledge. "The real value in Domino is letting us empower non-technical users who have knowledge to become content providers and connect to the Web without intermediaries," he said.

Notes and Domino were the only real choice for developing TradeHub and ChamberNet, according to Pilavsky. "As we examined available technologies," he said, "it became clear that Notes offered the best solution to aggregate data from a variety of sources. The strength of Notes lies in its replication and document-management infrastructure and its ability to control a very large publishing operation and put it through standard quality-assurance procedures."

Pilavsky also liked the Notes development environment, which allowed his team to build TradeHub and ChamberNet over four months with a minimum of trouble. "Although Notes has a very sharp learning curve," he said, "once you understand its architecture you can rapidly develop full-service applications without writing any HTML code."

Although Domino is well suited to document management and Web publishing, Pilavsky cautioned potential users to remember that "Notes is not a relational database, so access to data is not as simple as with an RDBMS (Relational Database Management System). Although serious transactional databases like customised catalogues are possible within Notes, once you get to that level you should consider putting an RDBMS behind it." ABOL faces this issue in its next project, a Web-based application to provide a full business-to-business procurement cycle incorporating real-time transactional data.

For publishing and electronic commerce projects, however, Domino continues to suit ABOL's needs. In June, the organisation launched a new service leveraging Notes' built-in agent technology. Called ChamberNet NewsLine, the free service records visitors' areas of interest, then uses agents to watch for articles in those areas. Notes then combines these into a customised email bulletin to keep businesses up to date.

David Braue

Given the relatively small size of the network being deployed, the Standard Edition of SuiteSpot (Version 3.0, priced at $US4,995 for a 50-user licence) would probably be sufficient for Salami's needs. This can provide most of the core services required, including email to all desktops, Internet and intranet-building tools, and database access systems. (The Professional Edition includes additional components, such as the Certificate Server, which might be useful further down the track as the company extends its online offerings, but would be of limited or no use in the deployment stage; the FastTrack Server is aimed at smaller enterprises and was still in development at the time of writing.)

Netscape's pricing model for SuiteSpot 3.0 allows the user to select five server components. For Salami, the most useful selection would be the Messaging Server, of Directory Server, Proxy Server, Enterprise Server (which includes the LiveWire Pro database development tool), and Collabra Server. (SuiteSpot 3.1 was in beta testing at the time of this project, and follows a different pricing pattern, but includes all of these core components.)

One important caveat is that the SuiteSpot product presently only runs on Windows NT and selected Unix platforms. Novonyx, a joint-venture company between Novell and Netscape, plans to release versions for IntranetWare in the third quarter of this year, but these had not materialised in beta form when *APC* went to press.

Salami Enterprises will thus either have to upgrade its existing NetWare server to Version 4.11 and wait for the release of the

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Novonyx product, or switch its server to Windows NT or an appropriate flavour of Linux. Given the company's current PC-centric setup, Windows NT 4.0 would be the easiest transition.

For mail services, there are two options. If the company chooses to abandon its existing cc:Mail system, it could immediately switch to using Communicator's Messenger email system on all desktops, running from the central Message Server. Legacy mail data from cc:Mail can be converted automatically using the Netscape Migration toolkit (this is free to sites with more than 100 client licences, but for the somewhat smaller Salami, an additional cost will probably be involved). Old mail addresses can be retained by using a redirector host.

A second possibility would be linking the existing cc:Mail server into the Message Server using an SMTP gateway from Lotus, and phasing out the cc:Mail server out over time. However, since there are few processes dependent on the availability of specific cc:Mail features, coexistence for a long period is probably unnecessary.

One useful advantage of Netscape's system is that multiple users can share a single machine, each with their own user profile and email details, making the deployment of just four new machines — one for each of the currently disconnected warehouses — a realistic possibility. This would also reduce the number of modems required, with just one needed for each remote system. IP would be the standard network protocol for all transactions.

As with most of the other solutions proposed here, the most effective performance at the server would be gained from a high-speed ISDN link. Given the modest nature of Salami's requirements, a partnership with a corporate ISP would provide a suitable connection for remote clients.

Database connectivity

SuiteSpot provides at least three different options for accessing the existing database using its own built-in tools. LiveWire Pro includes drivers for dBASE, so the core database could be maintained as is, with access made available to external users via either CGI forms or Java controls. For users in the main office, this would mean no change to the core application.

LiveWire Pro also includes a choice of either Informix-OnLine Workgroup Server or Oracle 7 Workgroup Server. If the database was appropriately converted, then either of these could form the basis of the new solution. Given the age of dBASE technology, this would be a more future-proof solution, but would still involve extensive development and increase training times.

Regardless of which choice is made, however, the basic solution for users outside the main office will remain essentially the same: develop a series of intranet forms that are used for basic data entry and validation and which are submitted via the mail server directly into the database or to clerical staff for validation. (If the company decides to switch its key database technologies, then it may make sense to use the same forms for main office staff as well.)

The Enterprise Server will form the core of the company's proposed Internet presence, and should (with appropriate devel-

Online Trading Post

When Commercial Dynamics was developing its Web site early last year to put its 11 *Trading Post* papers online, the obvious technology choice was Netscape.

The company was not a Microsoft site, explained Evan McBeth, Web designer and marketer for Commercial Dynamics' Online Trading Post, and was already familiar with Netscape browsers. "We're a Sun house and very thoroughly a Netscape house because of their devotion to industry without creating their own standards," McBeth said.

All the company's systems run on Sun hardware with a 0.5M ISDN link that connects directly into the Telstra Internet backbone. The classified advertisement data is stored in a Sybase database which connects to the Web server via an API written on C by Commercial Dynamics' own developers. All Web software is based on the Netscape series of servers, and Commercial Dynamics is currently evaluating SuiteSpot 3.0 for its security features.

The Online Trading Post is currently the most popular Australian classifieds site, according to the 'Where did we go last week?' survey by Ian Wilson (at http://usr-www.mpx.com.au/~ianw). Seeking to maintain its competitive edge, Commercial Dynamics is looking at using NetCaster, part of the Netscape Communicator client, to push content to users. Starting around October, Online Trading Post users with Communicator installed will be able to register their interests, then receive appropriate advertisements. While other sites were currently offering a similar service, Trading Post's differentiator will be its ability to send out HTML packages, including links and images, instead of ASCII text, according to McBeth. "Many people think NetCaster can only be used for companies like CNN. We can use it for other means. They're giving us the basic lump of dough and we shape it," he said.

Using a technology when it is leading rather than bleeding edge is Commercial Dynamics' policy, said McBeth. "Rather than being the first in the market we would rather be best . . . It's a family business with built-on credibility and when we launch something, we want to do it well."

The same applies for online commerce. The Online Trading Post does not yet allow for online commerce, not because secure technology does not exist, but because of the lack of general acceptance.

"We fully intend allowing people to pay over the Internet," McBeth said. Commercial Dynamics was talking to Advance Bank and Westpac regarding direct debit and Visicash and eVend for online payments later this year.

Commercial Dynamics also uses Netscape's Web server for distributing information internally over its intranet. The company is not yet using Netscape for email, although it plans to do so. "It's not a decision we're taking lightly. We have to evaluate the potential problems."

The company has not needed to go outside its small team of IT staff for consulting, and McBeth said both Netscape and ComTech, from which the company has purchased hardware and software, have given extensive technical support.

The Online Trading Post is at http://www.tradingpost.com.au/.

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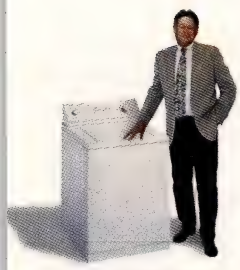

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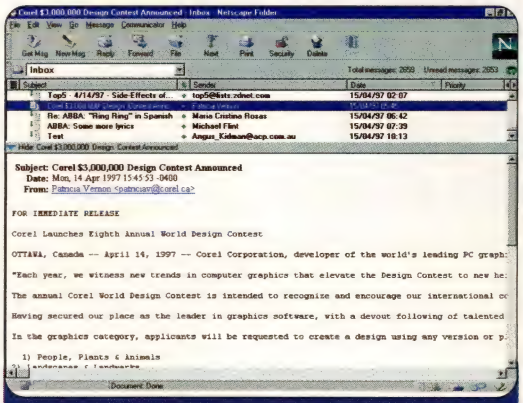
Picture The Possibilities

opment) be able to draw data directly from the goods tracking system and present it in a secure environment to clients. The basic design of the site can easily be created by the company's marketing agent; a contract programmer would then be required to create the data access pages, using LiveWire Pro and the Enterprise Server tools to extract data from the main database.

One decision which might prove to be difficult is where to host the site. The size of Salami hardly seems to justify establishing a dedicated server, and because the company information will only change on an irregular basis, hosting with an external provider (presumably also the ISP being used for connectivity for the remote offices) would be the obvious choice. However, this site would still need to interact with the database in the main office, which might prove to be a heavier workload than a dBASE database can cope with.



An all-Netscape solution would switch from cc:Mail to Messenger.

The most obvious (and expensive) solution would be to upgrade the company's own main server so that it can cope with external traffic. A second possibility might be to upload a daily replica of the relevant customer records to the ISP host, which would not provide 'real-time' access for external customers querying their orders, but would still enable a next-day service and substantially reduce traffic on the main server.

Pros and cons

Conceptually, the Netscape solution is elegant, and offers a more straightforward path to creating an integrated Internet/intranet presence than Microsoft or Lotus alternatives. This conceptual simplicity comes at a cost, however; a good deal of development work will be needed to convert the basic technologies offered by Netscape into a working system. (As it stands, the system also makes something of a mockery of the 'one-stop shop' concept, since it will probably also have to include new products from Microsoft and either Informix or Oracle.)

Looking towards the future, the system should be fairly easily extended; there should be no shortage of Java or HTML developers, and these technologies are also widely deployed by other vendors, which means that adding additional components should be relatively straightforward. In particular, when the company looks to offer live database access for its clients, this should be a relatively straightforward extension (hardware will probably be the major consideration at that time).

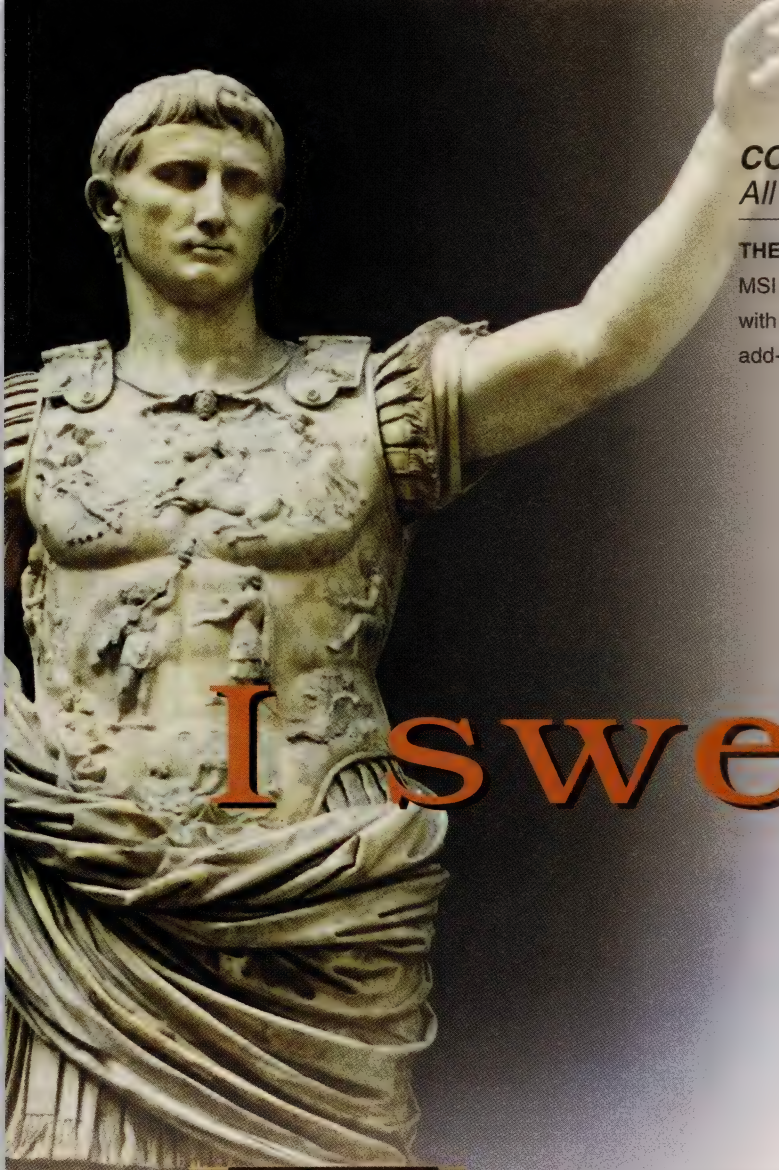
One obvious advantage Netscape offers Salami is the relatively low hardware requirements for clients. If the existing Windows 3.1 machines were left in place at the main Sydney warehouse, they wouldn't entirely meet the requirements for the Windows 3.1 version of Communicator, which calls for 16M of RAM. However, depending on the final design of the data input system, it might well be possible to use Version 3.1 of Navigator (which includes a less sophisticated mail client and no collaborative tools), since it can function quite effectively in 8M of RAM. Upgrading memory will in any case be cheaper than buying entirely new machines.

While it would be unlikely that the company would install such low-spec machines in its other warehouses, it can still plan a relatively cheap deployment (which could in turn translate to more actual machines within the organisation). The main server will be able to remain in place, but its connectivity options will need upgrading. Because the solution is built on Internet technologies, connecting mobile users should not be too difficult.

Training costs — an important consideration given the low level of technology penetration within the company — are also favourable to Netscape, since users need only master basic browser and form techniques and some simple email composition and management skills.

Although it would probably not be a major factor in making a purchase decision, a final advantage of the Netscape solution is the relative ease of access it will offer to the company's external marketing agency, which is running in a Macintosh environment. The Macintosh version of Communicator would give the agency the same potential access rights as company employees.

Angus Kidman



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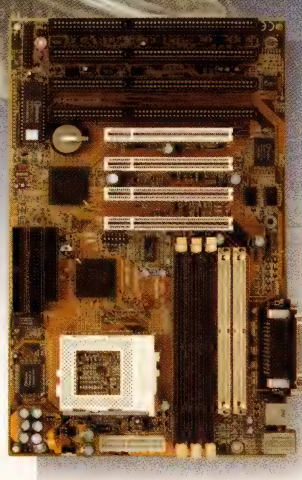

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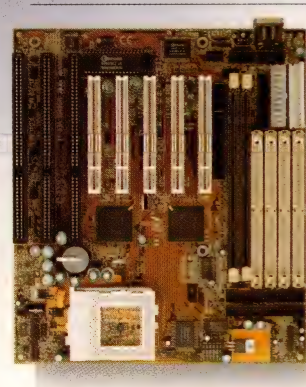

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Improving access to Salami's corporate database

By David Braue

Salami Enterprises wants to implement an intranet/extranet-based system that will not only provide a more efficient way to handle orders, but will also let customers interact with Salami's database system in real time.

While integrating back-end databases with Web sites used to require sophisticated scripting and development using CGI (Common Gateway Interface), a new generation of applications automate the process with visual development and powerful drag-and-drop tools. It is now a simple matter to integrate company databases with a Web interface. The options for Salami are many; choosing the right solution is simply a matter of weighing cost versus each solution's capabilities and its ability to support future expansion.

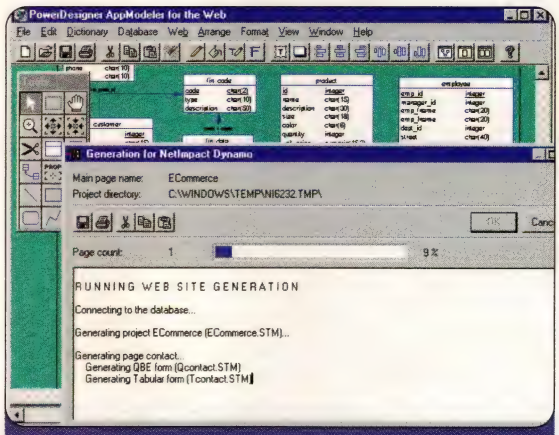
The capabilities Salami is looking for — remote order entry and a customised Web interface for customers — are becoming basic requirements of many intranet projects, according to Jeff Warren, managing consultant with Melbourne consultancy Intranet Australia. "Last year you could talk about database integration as a second phase," Warren said. "This year, that's where everybody wants to start. Within an intranet, it should be quite irrelevant where the content comes from. Rather, it should be delivered according to its importance to the business."

Tackle the back end first

While many Web-integration products happily support dBASE, Salami Enterprises should consider the potential benefits from migrating its order-tracking application to a newer database. "To take Salami into the '90s, they really need the type of environment that will give transactional recovery and high performance," explained James Farrell, Powersoft product marketing manager with database vendor Sybase. "Although dBASE was good when the company was small, they'll want to make sure they've got a path for their systems to grow as the company grows."

Although cost-conscious managers may shy away from the cost and hassle of installing a full-fledged enterprise database, major database vendors all offer inexpensive, scaled-down versions of their applications designed for small and medium-sized organisations. Sybase, for example, offers SQL Anywhere, while Informix has Informix Workgroup Server.

Another advantage of adopting a newer database management system is the ability for Salami to store its public Web site inside the database, pointed out Informix senior sales engineer Chris Chilcott. "One of the main issues driving the Internet is the manageability of Web sites," he said. "Because today's databases are parallel and scalable, managing the site inside the database means performance can be maintained as the site grows. Salami Enterprises will get a much cleaner application interface, and orders-of-magnitude improvements in manageability and performance." As well, this way the site will be backed up and managed like the rest of the database. Although migrating the decade-old dBASE application to a new platform will require some work and expense, the potential performance and business benefits such an upgrade offers mean that this one-off investment will be money well spent.



Sybase's PowerDesigner generates Web applications from the database.

Although company-wide email will improve communication between offices, Salami's intention to automate remote order entry by letting employees email new orders to the central office suggests the company would do well to look at the offerings from Sybase.

Because of the design of SQL Anywhere's transaction log, Farrell said, the database doesn't require a proprietary client for remote replication, as do solutions like Lotus Notes. Instead, the program bundles changes made on the remote system into a standard email message that can be sent to the database server using any email client. The database server automatically picks up the changes and updates the database. Since Salami has made such a significant investment in email infrastructure, company executives may find that Sybase's replication capabilities fit in particularly well with their plans.

This feature alone could justify migrating the dBASE system to Sybase.

Orders over the Web

Since Salami Enterprises is already moving to an intranet-based framework, the company should also consider forgoing email replication for an order-entry system based on Internet standards. This way, warehouse staff can enter transactions over the intranet while remote salespeople could use the same interface over the Internet to enter their own orders. Providing a consistent interface for order entry would have the desirable side effect of reducing training costs.

The means of developing this type of order-entry system have evolved over recent years, and continue to improve as vendors continually update their tools.

The first, and oldest, way of linking databases to Web pages is to use CGI scripts to carry data from Web forms back and forth to database engines. In common use on the Web, CGI scripts are readily available for many functions and can competently handle relatively simple tasks. However, CGI tends to perform slowly and generally can only handle one query at a time, making it eminently unsuitable for serious transaction-based systems and corporate infrastructure of the type Salami needs. As well, Chilcott pointed out, CGI scripts do not maintain persistent information about user sessions; once they have performed a given task they start again from scratch next time.

Providing high-performance connectivity

Companies with Web sites that have outgrown CGI are increasingly turning to middleware products, which not only expand on CGI's functionality but also

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support most major databases and Web servers. By complementing CGI's data-passing features with additional functionality, middleware products enable fully-featured solutions integrating Web sites and corporate databases. Just about every database and development tool vendor has its own middleware. Informix, for example, has repackaged the Web DataBlade technology from its Illustra acquisition in its Universal Web Connect, while Sybase offers NetImpact Dynamo. Novell, building on its close relationship with Oracle, incorporates middleware capabilities in its NetBasic scripting language.

"Middleware's ability to maintain the state of user sessions lets companies have integrity in their databases," Chilcott said. "You can do things that you couldn't do with CGI scripting, and with direct connections into Microsoft and Netscape server APIs you can do away with CGI altogether." By removing the dependency on CGI, applications using middleware also run much faster. The flexibility and feature set of most middleware solutions make them ideal for letting customers log onto the company extranet to check their orders in real time. "It would be incredibly easy" to implement this kind of solution, explained Sybase's Farrell. "You could pretty much take all you need to build it from the demonstration application that ships with NetImpact Dynamo." By embedding special HTML tags containing SQL queries into a Web page, Farrell said Salami could easily display outstanding customer orders. When the middleware intercepts the HTML tags, it passes the query to the database, then formats the results and passes them back to the Web server. This capability would let travelling salespeople, regional warehouse staff, and eventually customers enter new orders into the database using one standard Web interface.

Developing application logic

Of course, connectivity isn't everything. For applications that require more than just shuttling data back and forth, companies will want to set up application logic that really helps Web-based applications perform useful business tasks. "Companies that are building logic into transactional servers now will be best positioned to take advantage of the Internet in the future," said Sybase's Farrell, "because they will easily be able to move their business processes online."

These days, Web-enabled development environments are a dime a dozen: notable solutions are Bluestone's Sapphire/Web (distributed by Unixpac), Borland's IntraBuilder, Sybase's PowerDesigner and Allarire's Cold Fusion (distributed by EastCoast Software). Mainstream development tools like Visual C++ and Delphi include their own Web capabilities, and many tools are not distributed in Australia but can be ordered or downloaded from the Web.

Ultimately, all of these packages accomplish the same task: providing interactive, client/server functionality using a Web browser as the user interface. "We see the Web as just one of the mechanisms companies are using to build their information technology systems," said Centura Software's managing director Roy Brady. "In the future, the Web will be used not only to reach customers but to give companies a technology platform for systems they might previously have deployed on mainframes or other platforms."

It is now a simple matter to integrate company databases with a Web interface.

For its part, Centura is helping provide full-service intranets with its own tool called ForeSite, an application server that connects applications and HTML templates. The goal of ForeSite, Brady said, is to "merge the creativity of HTML people with the solid expertise of MIS people. This lets companies build sites that have the robustness and reliability of traditional mainframe systems." By automating the process of blending HTML pages with application logic, Brady said, today's development tools make developing Web-enabled applications much easier than in the past. "You could do all this in the past with existing development tools," he said, "but you're at a very low level dealing with APIs, and it's fraught with error."

With just 40 employees, Salami Enterprises does not have the development resources of larger companies and will likely want to outsource development of its Web-based transaction systems. But for companies that want to take the development reins, new tools provide an increasingly easy way to merge corporate databases and other information sources with a Web interface.

Java: connectivity for the future

Although middleware will handle Salami's immediate needs, Java is providing an increasingly functional solution for companies that want to develop complicated client-side applications. Most new development tools can take care of all the dirty work in producing database-enabled Java or ActiveX applets. Borland's upcoming JBuilder, for example, is specifically intended for this purpose.

Because Java allows the incorporation of advanced functionality such as encryption, Java applets — combined with Java middleware such as JDBC (a Java version of the ODBC database connectivity standard) — provides a powerful environment for Web-based corporate applications. For example, although JavaScript enables field-level validation to make sure users don't enter invalid information, doing this task with Java is much more efficient.

"If you were going to build a high-volume intranet application, you would want to go with Java because you can build transactional security into your system, and be able to handle much higher transaction volumes by adding intelligent data filtering capabilities," said Farrell. "As well, you can get better access to data by using a Java applet talking to a JDBC driver hooked directly to the database." Performance will improve further with specialised Java database interfaces like Informix's Data Director for Java. For less complicated systems like Salami's, Farrell said he would recommend sticking with more straightforward solutions, like combining PowerDesigner for code development and NetImpact Dynamo to handle database communication.

Taking Salami into the future

With so many solutions on the market, Salami could be forgiven for being a little confused. For now, the company should migrate its data to a modern database and have a development house develop an integrated, Web-based solution. By establishing direct links to back-end data sources using universal middleware, the company will gain the flexibility to support its employees as well as give its customers relevant access to company data. Ultimately, if Java offers advantages, Salami can easily implement it. As Intranet Australia's Jeff Warren explained, "Whether you're using hand-held devices, network computers, network-connected PCs, or calling over your mobile phone, these are all just front ends. The key is developing an open information architecture that supports whatever you want to do in the future."

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Sell the network, keep the networkers

By Josh Gliddon

The kindred spirits of the corporate '90s — the networked corporation and the need to focus on core competencies and outsource everything else — have been the drivers for the growth in value-added services from companies like Telstra, IBM, Lotus and Novell.

By moving from an owned infrastructure to an infrastructure-on-demand model, companies are able to seize the opportunities presented by a wired workforce without the capital expenditure and ongoing maintenance and reliability issues such a move entails.

IBM's Global Network, managed through its ISSC subsidiary, offers a range of network outsourcing services, the premise being 'why do it yourself when we can do it for you?'. Global Network has a presence in 860 cities across 100 countries, meaning virtually any size company with any type of networking requirement can be catered for. IBM boasts 24-by-seven reliability with full management and the ability to integrate heterogeneous technologies into a single, unified network. Also available are transaction services, as well as full voice, data and video integration.

Global Network Services becomes somewhat murky with the news that ISSC is to be spun off into a joint venture with Telstra to be known as Advantra.

Advantra's mission is to provide networking outsourcing, including intranet services. However, it was unclear at press time whether other Telstra and IBM outsourcing services will also fall under the Advantra banner.

For Notes users, Telstra Multimedia, a wholly-owned Telstra subsidiary, offers the Telstra Notes Public Network (TNPN). Launched in September 1996, TNPN is poised to undergo a rename and a revamp, with a range of services designed to appeal to both corporate and SMEs, as well as mobile business users needing to access Notes mailboxes from POP3 servers anywhere on the Web.

Telstra's corporate offering encompasses both Lotus Domino and Notes 4.5 services, enabling guaranteed performance coming in over X.25 and ISDN, as well as access via the Internet, although performance can't be guaranteed using this access methodology, said Telstra Multimedia extended enterprise product general manager Rob Charlton.

With the introduction of Domino-based services it is also possible for companies to use TNPN as a Web site and application hosting service. "We want to make it inexpensive, easy and quick for people to get their Web sites up using the applications the business normally uses.

"To me, the real power of the Web is to be able to take your normal applications and open them up to your staff, wherever they are, under security, and then take those applications, when appropriate, and allow your customers and business partners access to them," said Charlton.

Further down the track Telstra intends to offer applications for rent alongside its Web hosting services, using Lotus's SPA (Service Provider Application) framework. "It's also important to us to offer Australian-developed applications where possible. That's the great thing about Notes — there are literally thousands of applications out there, and they are constantly being developed."

Novell is also a player, but its core VAS service, Novell Connect Services, which uses Novell Directory Services (NDS) as its centrepiece, is not available in Australia. "We're in negotiations with Telstra, and have been for some time, but no dates for service introduction have been set," said Novell Asia-Pacific strategic development director Peter Sandilands.

NCS uses carrier infrastructure to connect disparate NetWare-based networks into a unified WAN. Because the service is carrier based, virtual WANs can be created and accessed anywhere a carrier has a point of presence, as well as through the Internet, and via dial-up connections. "It's a matter of the carrier coming in and putting a plug in the wall. You connect your network to that, and as long as you have rights, you can access any server, application or resource on that network, no matter where it is."

Novell has signed Deutsch Telecom and Nippon Telegraph and Telephone to the service, and is in discussion with five South-East Asia based carriers.

"I think with deregulation and privatisation, NCS is down on Telstra's list of priorities at the moment," said Sandilands.■

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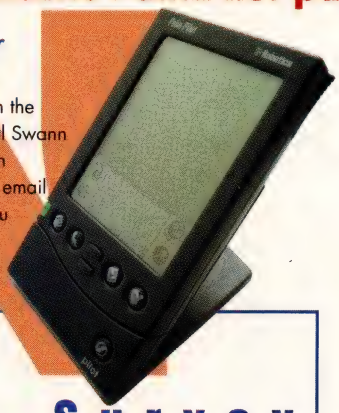

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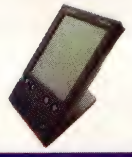
7 How often do you access the Internet?
Several times a day ☐ 1 Several times a month ☐ 4
Several times a week ☐ 2 Less than once a month ☐ 5
At least once a week ☐ 3

8 If you use the Internet as part of your business, how is it used? *(Tick as many as apply)*
Core part of business ☐ 1
Direct sales ☐ 2
Marketing/PR ☐ 3
Client contact ☐ 4
Intranet/Extranet ☐ 5
Business resource ☐ 6

9 Why do you read APC? *(Tick both if applicable)*
Work-related ☐ 1 General interest ☐ 2
Other (Please specify)

_____ ☐ 3

Readership Survey



10 What is the primary business activity of your company?

_____ ☐ 1

11 If your business activity is computer related, please tick the applicable categories:

Manufacturer ☐ 1
Retailer ☐ 2
Distributor ☐ 3
S/W developer/programmer ☐ 4
Consultant ☐ 5
Educator ☐ 6
Other *(Please specify)* _____ ☐ 7

12 What is your job title/position?

_____ ☐ 1

13 Which category best describes the size of your company?

Less than 20 employees ☐ 1
20-199 employees ☐ 2
200-499 employees ☐ 3
500+ employees ☐ 4

14 Do you influence the purchase of computer/IT products or services for your company?

Yes ☐ 1 No ☐ 2

If no, please go to question 18

15 For which of the following categories do you influence the purchase?

PCs ☐ 01
Servers ☐ 02
Monitors ☐ 03
Modems ☐ 04
Printers ☐ 05
Scanners ☐ 06
CD ROM ☐ 07
Laptops ☐ 08
PDAs ☐ 09
Networking/Comms ☐ 10
Platforms ☐ 11
Desktop O/S ☐ 12
Office product software ☐ 13
Development software ☐ 14
Database software ☐ 15
Intranet/Extranet ☐ 16
Web development ☐ 17
IT consulting ☐ 18
Other ☐ 19

16 What is the approximate total dollar value of computer/IT purchases you are involved in?

Last 12 months _____
Next 12 months _____

17 Do you have responsibility for: *(Tick both if applicable)*

Final purchase decision ☐ 1
Specifying product brand ☐ 2
Specifying computer configuration ☐ 3

18 Australia's top selling computer magazine.

My suggestion (in less than 10 words) for a new positioning statement is:

_____

_____

Closing details

Individual survey details are strictly confidential, not used for mailings or for any purpose other than the summary results.

Name: _____

Phone (daytime): _____

Sex:

Male ☐ 1 Female ☐ 2

Age:

Under 20 ☐ 1
20-29 ☐ 2
30-39 ☐ 3
40-49 ☐ 4
50+ ☐ 5

What is your total annual income BEFORE tax? *(Include income from all sources: wages, dividends, rents and so on)*

Under $25,000 ☐ 1
$25,000 - $34,999 ☐ 2
$35,000 - $49,999 ☐ 3
$50,000 - $74,999 ☐ 4
$75,000 - $99,999 ☐ 5
$100,000 - $149,999 ☐ 6
$150,000 - $199,999 ☐ 7
$200,000+ ☐ 8

How to enter:

Only single, completed entries per person will be accepted. Completed surveys will be selected at random to ensure authenticity.

The prizes will be awarded for the best replies to question 18.

Once completed, please return the survey to us by September 30, 1997 either by:

- Freepost (no stamp required).

Reply Paid 444
Price Waterhouse
GPO Box 4177
SYDNEY NSW 2001

- Or fax to 02 9256 7777.
- Or the survey is also available on APC's Web site http://www.apcmag.com/surveys from August 24 to September 30, 1997.

CONDITIONS OF ENTRY

1. Instructions on 'How to Enter' form part of these 'Conditions of Entry'. Entry is free and open to all residents of Australia other than employees of ACP Publishing Pty Ltd ACN 053 273 546, Swann Communications ACN 006786072, their families and associated agencies.
2. The contest closes last mail September 30, 1997. The contest will be judged by a panel appointed by ACP Publishing Pty Ltd on October 31, 1997. The judges' decision in relation to any aspect of the competition is final and binding on every person who enters. No correspondence will be entered into. The best replies to the final survey question will be awarded the prizes. Chance plays no part in determining the winners. No responsibility is accepted for late, lost or misdirected mail. All entries become the property of ACP Publishing Pty Limited, the promoter, 54 Park Street, Sydney, NSW 1028.
3. The prize pool, valued on August 8, 1997 consists of five PalmPilot packages worth over $650 each. The prizes are not transferable or redeemable for cash. Any change in the value of the prizes occurring between the publishing date and the date the prizes are claimed is not the responsibility of the promoter.
4. Prize winners will be notified by mail and their names will be published in the January 1998 issue of Australian Personal Computer.

Other comments on APC:

_____

_____

_____

With prices for flatbed scanners dropping dramatically, APC *decided it was time to take a look at some of the latest and greatest in low-price scanners.* **By Jim Endersby**

Scanning the horizon

All the scanners reviewed here retail for under $800. At that price we expect them to be aimed at home users and small offices, and our testing procedure (see 'How we tested') reflects this. We concentrated on ease of use for every aspect of the machine, from the way it's packaged to the quality and usability of the software supplied with the machine.

Most of the machines we reviewed failed our ease-of-use test rather badly, usually due to poor documentation or confusing set-up instructions. For example, Microsoft has provided a standard way to add hardware to a Windows 95 system — go to the Control Panel and click on the Add New Hardware wizard. Unless a new piece of hardware is fully Plug and Play compatible, we would expect it to be installed using this method, especially when the hardware is priced to appeal to non-expert users. Yet only one of the scanners reviewed here (Microtek) uses the Add New Hardware option — and even the Microtek uses it in an odd way. Unless the scanner in question was Plug and Play (and few scanners are), it lost points for using a non-standard set-up procedure. Challenging the Microsoft juggernaut is all very well, but not at the cost of baffling the hapless user.

Another confusing aspect of scanners is the technical specifications: a dizzying list of numbers that define resolution, colour depth, sampling rates, interpolation frequencies and so forth. Computer companies are forever trying to brainwash us into thinking that more is always better, so many users will probably assume that bigger numbers mean a better scanner. However, when it comes to scanners more is often less. Selecting the scanner with the highest resolution or colour depth may not produce the highest-quality scans. The raw numbers simply don't tell you how good a system's optics are, nor how well built its mechanical parts might be. For example, when it comes to resolution, only the horizontal optical resolution (the first number in our table's 'Optical resolution' column) really tells you anything; vertical and interpolated resolutions are much less useful.

This irrelevance of specifications is well illustrated by the fact that of the scanners tested, the Editors' Choice — the Hewlett-Packard ScanJet 5P — has the lowest optical resolution on paper, but produced the best scans in our tests. For many potential scanner uses, choosing the highest colour depth or resolution available will simply produce massive files that clog up your hard disk and take forever to open. If you're scanning in Web images, for example, there is simply no point in creating 5M or 6M files.

We have also assumed that most people shopping for a scanner under $800 are not digital-imaging experts and don't want to spend years mastering the minutiae of Nyquist or modulation transfer frequencies. Nor are they likely to own or buy very expensive image-editing or calibration software, so we simply looked for the best-looking pictures, using the software supplied, at the default settings. We were particularly looking for scanners that included clear, easy-to-understand instructions on what settings users should choose for a particular job. We have included basic specifications in the accompanying table, but we suggest that picture quality is the best guide when buying a scanner.

Another potential pitfall for new users is that most of these scanners come supplied with a Small Computer Systems Interface (SCSI) adapter card which has to be inserted in the computer unless your computer already has a SCSI card. SCSI devices can be chained together in groups of up to seven or 14 devices (such as scanners, CD-ROMs, Zip drives and tape backups) running from a standard SCSI card. However, for this trick to work, each device in the chain must have a unique ID number and the first and last device in the chain must be terminated (the terminators tell the computer how many devices are in the chain). The instructions supplied with many of these scanners gave no details on SCSI devices, ID numbers or termination. This lack of information would make life very difficult for a non-expert user who already had a SCSI device in their machine and wanted to add a scanner. A failure to provide adequate help for users in this situation was another factor that reduced a scanner's ease-of-use rating.

Acer Acerscan 610 Plus

ACER

The Acerscan's documentation had easy-to-follow, step-by-step instructions. It also included a useful list of dos and don'ts, such as keeping the scanner away from direct sunlight and sources of vibration. This type of information should be particularly useful to anyone who has never used a scanner before.

While the installation and set-up instructions were clear and brief, they did assume that everything would go right first time. Everything did go right when we tested the unit, but the documentation offers very little help for users who strike trouble. There's no information, for example, on the supplied SCSI card, and no explanation of any of the potentially confusing technicalities of using multiple SCSI devices (such as how to change the SCSI ID of the scanner if you already have another device with the same ID). This might present problems for some users because this is not a Plug and Play scanner, despite Acer's slightly misleading description of it as having a 'Plug and Run interface card'.

As with most of the other scanners, the cable supplied with the Acerscan is a standard 25-pin SCSI cable, which is almost identical to a parallel printer cable. Novice users will need to be careful to check that they don't plug the scanner into the printer port. Although no harm will be done if you do, neither printer nor scanner will work.

The drivers supplied with the unit are compatible with both Windows 95 and Windows 3.x, but there was nothing in the box for Windows NT or OS/2 users. Updated drivers (including NT drivers) are available from Acer's Web site (http://www.acer.com), but we couldn't locate any OS/2 information.

The supplied applications were Version 3 of Ulead's PhotoImpact SE (a stripped-down version) for Windows 95 users and ImagePals2Go! for Windows 3.x users (the name alone should persuade you to upgrade to Windows 95). TextBridge Optical Character Recognition (OCR) software, for scanning in and recognising documents, was also included. All installed without problems and while none is particularly exciting or sophisticated, they all worked properly first time.

The Acerscan's TWAIN-compliant driver is called MiraScan and it offers only the most basic settings. We used the auto-exposure feature (as we did with all the scanners that offered one), but found it a bit heavy-handed: the resulting images had too much contrast in most cases, but were a bit flat in others. Overall, the default settings produced images that had good definition and high colour saturation, but were too dark. However, a little bit of trial-and-error tweaking would undoubtedly improve the results.

The Acerscan's preview time was fairly quick at only 12 seconds, but its final scan was about average at 32 seconds.

A couple of optional extras are available, including an automatic document feeder (for OCR scanning of multi-page documents) and a transparency adapter.

Distributor	Servex Australia
Phone	(02) 9870 4823
Online	http://www.servex.com.au
Price	$479
In short:	A good scanner at a nice price, but it may require some tweaking to get quality images.

Canon Canoscan 600

CANON

Canon's comprehensive-looking documentation turned out to have a few shortcomings. For example, there's a list of what's in the box, but it isn't illustrated. Indeed, the sheer amount of documentation might cause confusion, because there are three separate manuals, one for the SCSI adapter, one for Windows 95 software and one for Windows 3.x users, and it is not immediately clear which manual you should read first. There is no picture of the scanner nor one of how it should be connected to the computer. Although it's easy to do, someone who had never used a scanner before might find this lack of graphical instructions rather daunting.

Like most of the other scanners, the Canoscan has a carriage lock, which is used to protect it from damage during transport. However, the lock is not mentioned anywhere in the documentation and the unit could be damaged if it was operated without unlocking it. This is of particular concern because the lock is hidden away under the unit's cover, which must be completely removed before you can see the lock (we only located it because we were expecting one).

The documentation problems extended to the software setup. The Windows 95 instructions are clearly illustrated, with screen shots of each step, but in our tests Windows 95 simply detected the scanner and installed the scanner drivers without displaying the prompts shown in the manual. The scanner worked properly first time, so the differences between our test and the manual did not cause a problem. However, inexperienced users might be confused by seeing the 'wrong' thing on screen, since the setup is fairly complex.

The applications that come bundled with the scanner are currently being changed so, depending on when your dealer got its shipment of scanners, you will find either TypeReader 2 Plus and Adobe Photodeluxe, or Omnipage LE and Ulead's PhotoImpact 3.0 SE. We tested both Photodeluxe and PhotoImpact and found no problems with either.

Canon's TWAIN driver is called Scancraft CS and is rather more sophisticated

Editors' Choice apcmag

- **Editors' Choice:** Hewlett-Packard ScanJet 5P
- **Highly Commended:** Canon Canoscan

The Hewlett-Packard ScanJet 5P gets the Editors' Choice for three reasons: it had the best instructions; it produced the best pictures; and it is very reasonably priced. The Canon Canoscan was a close second. Its picture quality wasn't quite as good as that of the ScanJet and its instructions weren't as clear, but it is a solidly built unit with the added advantage of taking up very little desk space.

The Microtek ScanMaker V300 is a quality scanner at fantastic value.
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- **Ultra streamlined and compact design**
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CGM/INN9096

than most of its rivals. In addition to standard features like previewing and cropping images, it has a few more image-editing tools and can also be used as a single-step photocopier by sending the scanned image straight to a suitable printer without saving it to disk. The Scancraft manual is more comprehensive than most of the others we reviewed (only the Hewlett-Packard manual is of comparable quality).

The image quality was the second best of all the scanners reviewed. The default settings produced nice, bright pictures with plenty of detail, but they were a little flat compared to the Hewlett-Packard.

The Canoscan comes in two models: the 600dpi model reviewed here and a 300dpi version. There are automatic document feeders available for both, but only the Canoscan 600 can be fitted with a transparency adapter. Both take up less desk space than any of the other scanners reviewed — which should make them particularly appealing to home users.

- **Distributor** Canon Australia
- **Phone** (02) 9805 2864
- **Online** http://www.canon.com.au
- **Price** $799
- **In short** Good image quality and some advanced features commend this product.

How we tested

We started by assessing the instructions that came with each scanner. First we looked for a clear list of what ought to be in the box. Then, if there was a list, we looked at whether it was illustrated. We assessed how obvious it was where the new user ought to start and whether the sequence of appropriate steps was indicated clearly. Then we looked at how much help was provided if the installation didn't proceed as expected.

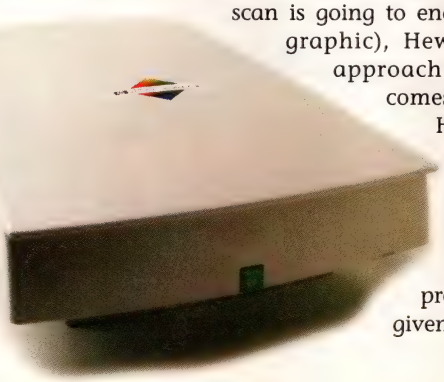
In each case we tested the software supplied with the product, on the assumption that most entry-level users would not want to buy additional software. In carrying out the test scans, we selected the same resolution (200dpi) and the same colour depth (24-bit colour), but left all the other settings at their factory defaults. If the software offered an automatic brightness/contrast setting we used it. In most cases the scans obtained could probably be improved by users who had the time and expertise to adjust the scanning software's settings, but we assumed that if the default settings were wildly inappropriate they reflected poorly on the software and severely reduced the scanner's ease of use.

Finally, we timed the scanner over three scans (using three different post-card-sized originals) and recorded the average times for a preview and a final scan. The results are given in the table.

Hewlett-Packard ScanJet 5P

HEWLETT-PACKARD

Like its closest rival, the Canoscan, the ScanJet 5P is a compact, solidly built unit which looks more robust than most of its rivals. Its instructions are impressively comprehensive. Starting with the well-illustrated packing list, they take you through clear, step-by-step instructions followed by detailed troubleshooting and technical information if you need it. This was also the only scanner that came with a clear guide the manufacturer's technical support options, including the company's Internet addresses.



Unlike many of its rivals, the ScanJet's manual clearly explains SCSI devices, IDs and chains. It also details the technicalities of SCSI termination and the fact that the ScanJet is intelligently self-terminating (which simply means that it will terminate itself if it is either the first or last device in a SCSI chain). Most users will never need to consult this information, but it is good to see it so well presented for the benefit of those who do.

We were also impressed with this unit's software set-up routine, which includes a simple screen-calibration utility. As a result, we found that the onscreen image previews were not only clear and sharp, but also matched the printed output more closely than any of the other scanners.

Hewlett-Packard's TWAIN driver, Picture Scan, is sophisticated but easy to use. Instead of offering users the choice of different colour depths and resolutions, it simply asks you to select the type of printer (or other output device) you'll be using. It then applies the optimal settings for that device. Most novice users tend to scan at either too low or (more commonly) too high a resolution for the type of job they're doing. By allowing users to simply select a target device (including the screen, if the scan is going to end up as a Web graphic), Hewlett-Packard's approach neatly overcomes this problem. However, it does not cramp the more expert user because the full details of each of the preset options are given in the manual and users can create custom settings if they need to.

Hewlett-Packard's concern with ease of use is also apparent in the fact that there is a single Scan button on the front of the scanner. Pressing it launches the Picture Scan software and scans the image. The software will also automatically detect the image area if you want it to, which saves a lot of tedious manual selection when you have a large number of scans to do.

The ScanJet's only weakness is the bundled software: HP's own PaperPort and HotDog Express are fine (although the latter, which creates Web pages, is an odd choice to include with a scanner), but the main image-editing program is Corel's Photo-Paint 5. It is a little disappointing to find such an excellent scanner being bundled with a 16-bit application that is now several years old. Anyone who buys the ScanJet would be well advised either to trade up to the current Photo-Paint 7 or a comparable application.

However, this is really the only feature of the scanner we could criticise. Otherwise, it's an excellent, solid unit which is reasonably priced and easy to use, and which produced the best quality images of all those we tested.

- **Distributor** Hewlett-Packard
- **Phone** (03) 9272 2659
- **Online** http://www.hp.com.au
- **Price** $599
- **In short** Despite its less-than-impressive specs, the HP had the best image quality of all the printers along with the best installation procedure. Its Editors' Choice is well earned.

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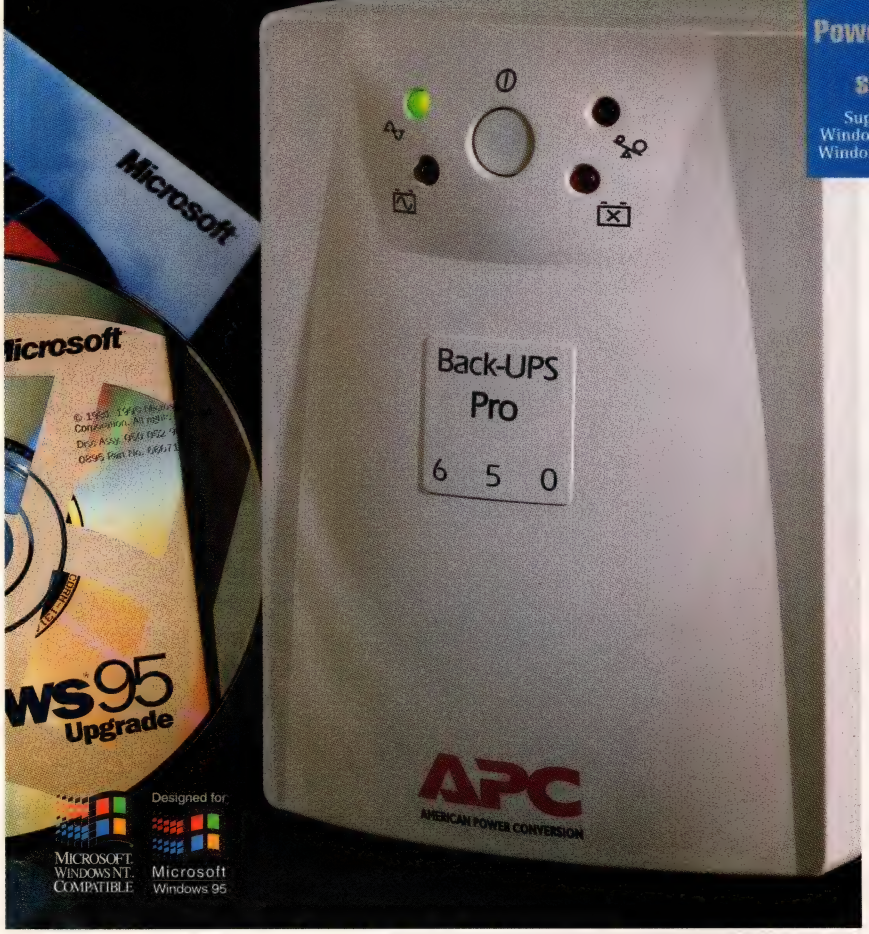

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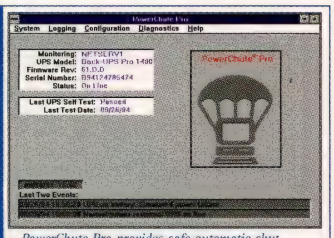

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Back-UPS 650	Pentiums Power PC	17 minutes
Back-UPS 1000	Multiple Systems	11 minutes
Back-UPS 1400	Multiple Systems	23 minutes

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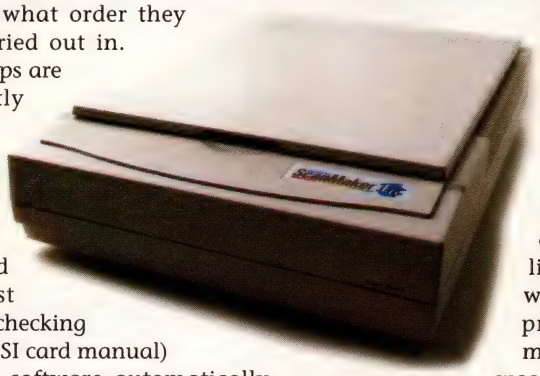
Microtek ScanMaker E6

MICROTEK

Microtek's manual refers users to the packing list, but there wasn't one with our review machine, nor was there a picture of the scanner or its parts. We felt this was a serious shortcoming in a scanner aimed at small-business and home users. The bundled SCSI card has its own, brief instructions which give information such as jumper settings but not much else. It does however, explain how a SCSI device chain works and what a terminator does.

The software installation is also not as straightforward as it should be so might prove a bit confusing. Although the CD has an AutoRun feature, it is not immediately clear from the resulting menu which steps are essential and which are optional, nor what order they should be carried out in. Some of the steps are also slightly harder than they need to be; users are expected to select the correct SCSI card from a list (which means checking the separate SCSI card manual) instead of the software automatically detecting which card has been installed.



The CD also includes Adaptec's EZ-SCSI Lite software, which is needed to run the scanner. This installed a real mode (DOS-based) driver which tried to load at startup but produced an 'out of environment space' error (because our NetWare network path variable was so long). We then had to change the default jumper settings on the SCSI card so that it could use one of the computer's free interrupt requests (IRQs). Finally, after we'd reconfigured jumpers, installed software and played with DOS environment variables, the Microtek set-up program used the Windows 95 Add New Hardware wizard. Overall, the Microtek had the most complex set-up routine of any of the scanners tested and despite being the only scanner which makes use of the standard Add New Hardware wizard, is about as far from the Windows 95 Plug and Play specification as it is possible to get.

The documentation doesn't include any guidance on using the scanner — no suggestions on colour depth or resolution — nor are there any on Microtek's Web site. Another problem was the SCSI cable, which was the shortest supplied with any of the review systems. This might prove a real nuisance to users who have limited space around their PC.

However, the bundled software was one of the more satisfactory aspects of the scanner. Omnipage LE for OCR work and a choice of either Ulead's PhotoImpact (for Windows 95 users) or ImagePals2Go! (for Windows 3.x).

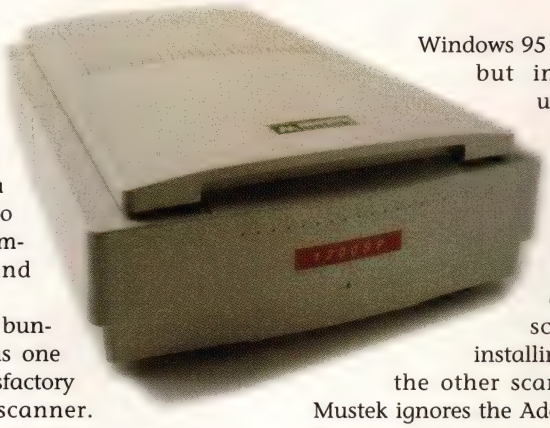
Scanning times were disappointing. The final scan was the second slowest of all the products reviewed. Although the difference between the slowest and fastest scanners was under 40 seconds, those seconds add up if you have a lot of scanning to do. Image quality was also a little disappointing, with default settings producing far too much contrast. This was especially noticeable in the lightest areas of the test images, which tended to be bleached out. Overall, this was the least attractive scanner in the batch tested, particularly considering that it's one of the most expensive.

- **Distributor** Proscan Australia
- **Phone** (02) 9904 1244
- **Online** http://www.microtekusa.com
- **Price** $799
- **In short** A little bit slow, with disappointing image quality.

Mustek Paragon 1200SP

MUSTEK

The documentation with the Mustek covers several scanner models and contains one or two inconsistencies. It refers to inserting floppy disks, but all the software supplied comes on CD-ROMs. This might seem a trivial point, but such small discrepancies can send an inexperienced user into a tailspin if they think there's something missing from their box. The CD-ROM supplied doesn't make use of the Windows 95 AutoRun feature but instead requires users to follow a rather complicated, multi-stage setup which involves some unintuitive steps, such as testing the scanner before installing it. Like most of the other scanners reviewed, Mustek ignores the Add New Hardware wizard, adding to the difficulty of installing the scanner.



Mustek's TWAIN driver is very basic, only allowing users to choose between colour or greyscale rather than selecting exact bit depths. Even image size can't be selected at this stage. However, these types of limitations were a common feature of many of the drivers and the necessary adjustments can always be made in the image-editing software.

Mustek includes drivers for Windows 3.x and 95 but there were no Windows NT or OS/2 drivers, nor could we find any on the company's Web site. However, the bundled applications are one of this scanner's real strengths — Mustek has included the full version of Micrografx's excellent Picture Publisher software (both Windows 95 and Windows 3.x versions), which provides a range of professional image-editing and manipulation tools that are well above those offered by most of the rival bundles. The bundle also includes TextBridge Classic software for OCR document scanning.

Scanning times were average but the resulting image quality was very disappointing. Some images were very dark with muddy shadows and low definition, while others were severely bleached out. It must be emphasised (once again) that these scans were made with the default settings, and could no doubt be improved by making various adjustments. However, we would expect the default settings on an entry-level scanner to give good results with good-quality originals — and by this criterion the Paragon's images are disappointing.

- **Distributor** Synnex
- **Phone** (03) 9540 0555
- **Online** http://www.mustek.com
- **Price** $599
- **In short** Some impressive bundled applications rescue what would have otherwise been a disappointing scanner.

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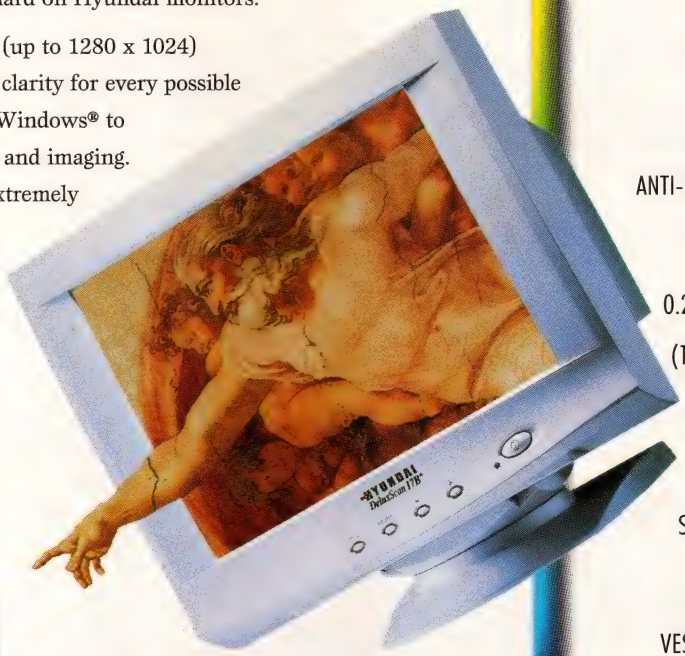

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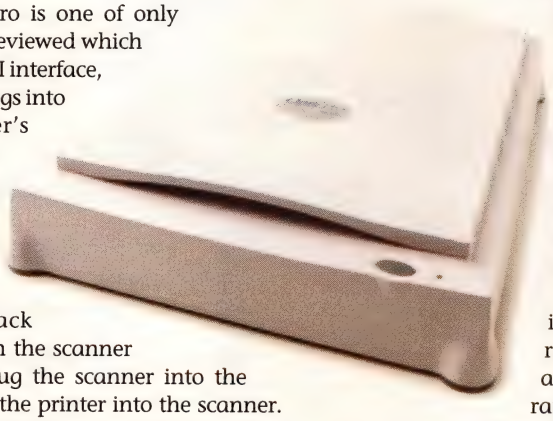
Plustek OpticPro 9630P

PLUSTEK

This was one of the few scanners that really seemed to have been designed with beginners in mind. The instructions, although brief, were exceptionally clear, and included an illustrated packing list and a large-format, step-by-step card that walks you through installation and setup. The OpticPro's installation instructions were almost the only ones to include clear safety warnings (complete with pictures), telling you to do things like disconnect the power from the computer before plugging in the scanner. This might seem a bit obvious, but it's much better have these spelt out clearly than to damage either your computer or yourself.

However, the brevity of the instructions is a problem if you hit a snag while installing the scanner (as we did) — there is no help at all to tell you what to do when a step doesn't go as it should. There is also a rather mysterious Access button on the front of the scanner. At one point during the setup you're told to press it, but it is never mentioned again, so its intended use is rather obscure. The instructions do contain some very basic scanning tips, but there is no printed documentation for the bundled applications at all — you have to rely on the online Help.

The OpticPro is one of only two scanners reviewed which don't use a SCSI interface, but instead plugs into the computer's parallel port, rather like an external Zip drive. As with a Zip drive, you can piggyback your printer on the scanner — you just plug the scanner into the computer and the printer into the scanner. While the parallel interface adds considerably to the OpticPro's ease of use, such simplicity has a price. Its scan times were among the slowest of all the units tested.



The bundled software was very poor. OpticPro's Action Manager (which is supposed to provide easy, instant access to all scanner functions), spat the dummy every time we tried to use it, giving us inexplicable error messages. The absence of printed documentation made it impossible to work out what the problem was. Fortunately, all the scanner features can be used without the Action Manager. The TWAIN driver was also a bit confusing, since basic settings such as colour and resolution are hidden by default. There was no automatic brightness or contrast feature and the colour-correction options included options such as 'Gamma 1.0' or 'Gamma 1.5' without explaining what these terms mean.

We were somewhat concerned by the lack of a carriage lock (to protect the scanner's moving parts during transit), particularly since this scanner seems designed to be easy to move from place to place. It was also made rather alarming noises while scanning.

The OpticPro's image quality was reasonable, with an acceptable tonal range and definition. However, the real beauty of this unit is its price — at just $299 it is one of the cheapest scanners reviewed here and despite our quibbles over its setup and documentation, represents exceptional value for money, particularly for home users.

- **Distributor** Creative Pacific
- **Phone** (02) 9906 8887
- **Online** http://www.plustek.com
- **Price** $299
- **In short** A fine solution for reasonable image quality at a very affordable price.

TWAIN: technology without an interesting name

All the scanners reviewed here offer TWAIN-compliant drivers. TWAIN allows a single driver to be installed that can be used by any compatible application. This means that you don't have to install separate scanner drivers for your image-editing software, your drawing or desktop-publishing program and your OCR package. Instead you set up your scanner once and it is then available to any TWAIN-compliant application (and that covers most recent applications).

Once your scanner is set up with a TWAIN driver, you can invoke it from any compatible application by choosing the command Acquire (usually from the File menu) and then selecting the TWAIN source (you can have several scanners installed if you wish).

TWAIN drivers normally consist of a mini-application that pops up over your main application, and allows you to do basic scanning tasks such as previewing and scaling. However, complex jobs, such as colour-correction or applying filters, are normally left to the program from which the TWAIN source was invoked.

The TWAIN Working Group claims that TWAIN does not stand for anything, but it is widely held to have been coined as a temporary name during development of the standard: it's short for 'Technology Without an Interesting Name'.

You can get more information on TWAIN from http://www.twain.org.

Primax Mediastorm 4800

PRIMAX

The Primax has the unhappy distinction of being one of the poorest performing scanners in this review. For a start, it had the worst set-up routine, which involved running several different programs one after another, with no explanation as to what they were or whether they were essential or optional. These multiple installations are not well integrated and, despite choosing English as our preferred language, we ended up with some dialog boxes in French. The bundled applications — MGI Photosuite SE for image editing and ReadIRIS for OCR — are 16-bit programs, neither of which have the now-obligatory uninstall option. Both are very basic and neither could be described as market leaders (in fact, neither had ever come to *APC*'s attention before).

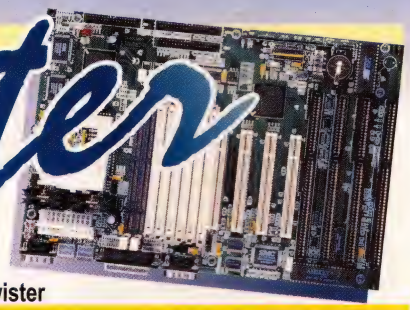
Virtually the only strong point about this unit is that it uses a parallel connection, which at least makes the hardware installation straightforward. The scan times were quite good, particularly given the parallel interface. However, the unit makes an alarming grinding noise while scanning, and has no carriage lock to protect the mechanism in transit. As a result, we had serious doubts about whether this scanner would stand up to the rigours of heavy use.

There is no auto-contrast or brightness setting and the onscreen image quality is terrible, as are the final printed results. No doubt a determined user could dump all the bundled software in favour of more sophisticated tools, and,

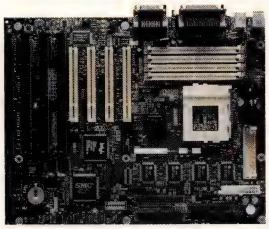
Beyond technology is knowledge.

MICRONICS

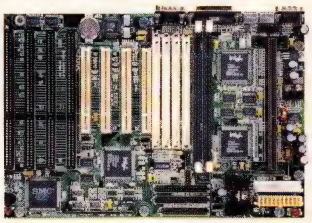
Twister MOTHERBOARDS



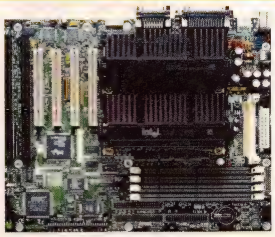
TAKING AUSTRALIA BY STORM Twister Pentium MMX/AMD K6; ATX; USB; Intel 430TX



M7S-Hi Pentium MMX/AMD K6; ATX; USB & Sound Optional; Intel 430HX



Stingray Pentium II; ATX; USB; Intel 440FX



Dual Fortress Pentium II; ATX; USB; LM78; Sound Optional; Intel 440FX

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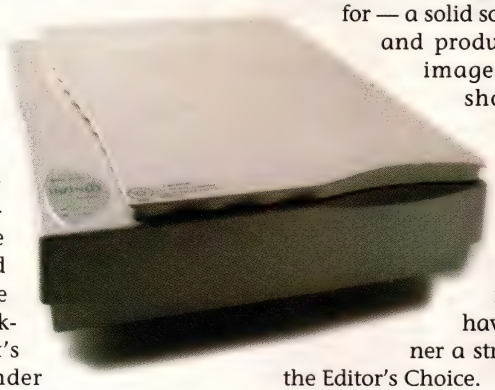
by persistent tweaking and fine tuning might eventually get acceptable results. But given that the Plustek OpticPro is the same price, we were left wondering whether anyone would bother.

- **Distributor** BBF Components
- **Phone** (03) 9761 4299
- **Online** http://www.primax.nl
- **Price** $299
- **In short** Although it is cheap, you can get a better scanner, the Plustek OpticPro, for the same price.

Relisys Infinity Scorpio

RELISYS

The supplied manual had plenty of information, including the goods on SCSI chains and the correct use of the supplied SCSI terminator. It includes photos of every step in using the scanner and even includes such details as how to place your original artwork on the scanner (this might seem daft, but it's surprising how many alternatives there are among these scanners — and we managed to make the wrong guess most times).



Connecting the scanner to the computer is simple enough, but we found the location of the SCSI socket a little awkward because it's tucked so far in under neath the rear of the scanner.

Somewhat surprisingly, there are no Windows 95 or OS/2 drivers supplied with the unit, and while the Windows 3.x ones worked, they didn't create program icons, a problem that would fox some beginners. Updated drivers, including those for Windows 95 and NT can be downloaded from Relisys's Web site.

Installation went smoothly and the instructions were easy to follow. However, the bundled image-editing software (ImagePals2Go!), like the drivers, is 16-bit only, which is a bit quaint in this 32-bit world, and means that there's no uninstall feature (something that always earns a reviewer's ire). The bundled OCR package is Omnipage LE. Optional extras available include an automatic document feeder and a transparency adapter.

Scanning times were very good: this was the fastest unit overall. It was particularly impressive to see the preview image appear so quickly — there's nothing more frustrating than a scanner which takes ages to preview a whole A4 page when you're only interested in scanning the logo in the top left-hand corner. The Scorpio's rapid preview means you can get straight on with the job. The final scan was also the equal fastest. The onscreen image preview looked rather pale, but the printed results were very impressive. This was one of the few scanners that managed to pick up the oddly-coloured shadows in one of our originals. It also did a good job at distinguishing very dark colours, a test that most of its competitors failed. While it is one of the more expensive units tested, users will find that they get what they paid for — a solid scanner that's quick and produces good quality images. The only real shortcoming is the bundled software. A more appropriate collection of software tools, together with a better manual, would have made this scanner a strong contender for the Editor's Choice.

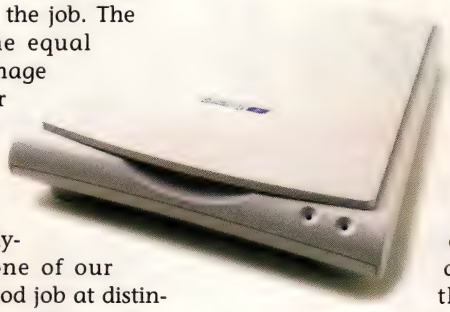
- **Distributor** Teco Australia
- **Phone** (02) 9765 8168
- **Online** http://www.relisys.com
- **Price** $799
- **In short** Apart from some poor software tools, this was one of the best scanners in the group.

Spot ScanTak 2c

SPOT

The ScanTak was the big surprise in this review. Not only was it the cheapest unit, but it had a very innovative, easy-to-install design. Once the proprietary interface card is installed into the PC, there is just one cable to attach. There is no power cord, because the scanner draws power from the PC, and the power/data cable is moulded onto the back of the scanner. As a result, there is just one plug to connect and only one place to put it. By reversing the normal male/female pin arrangement on a 25-pin cable, Spot has ensured that you cannot plug the scanner into the printer port (and, more importantly, you can't plug your printer into the scanner socket).

Despite having so few parts and such a simple design, the ScanTak has a very clear, illustrated packing list which is printed on the box and repeated in the manual. Perhaps the manufacturer is concerned that, since there are so few bits, buyers are certain to assume that something's missing. The manual also has excellent illustrated instructions for connecting and positioning the scanner, which cover subjects such as avoiding direct sunlight and vibration. This is the kind of manual we expect in a consumer product. Even the packaging for this scanner was sturdy and well-designed.



The software was not quite as impressive. The installation routine failed to complete, despite numerous attempts to run it. Our utilities reported that there was nothing wrong with the supplied floppy disk and we reinstalled Windows 95 from scratch to ensure there weren't any non-standard components to cause problems, but nothing could persuade the software to install. However, we were finally able to download an updated version of the software from Spot's Web site, and that installed effortlessly on our first attempt. Users without Net access would be well advised to check the availability of the updated software on disk before purchasing the ScanTak.

There was a second, very minor, problem with the software, which was that the set-up instructions don't direct the user to actually install the software. Given that the software is supplied in a separate, sealed envelope, this might confuse some users, especially since the manual for the bundled Scantastic application dives straight into using the product without giving any installation

Comparing the scans

Note: The following pictures were scanned at the same resolution (200dpi) and the same colour depth (24-bit colour) with all other settings left at the factory defaults.

Acer Acerscan 610 Plus

Canon Canoscan 600

Hewlett-Packard ScanJet 5P

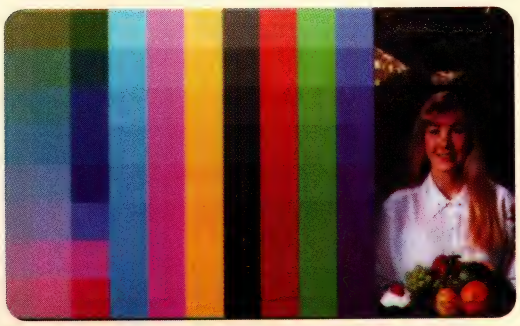
Microtek ScanMaker E6

Mustek Paragon 1200SP

Plustek OpticPro 9630

Primax Mediastorm 4800

Relisys Infinity Scorpio



Spot ScanTak 2C

Umax Astra 600s

Table One: scanning times

Scanner	Preview	Final
Acer Acerscan 610 Plus	12 secs	32 secs
Canon Canoscan 600	16 secs	20 secs
Hewlett-Packard ScanJet 5P	16 secs	28 secs
Microtek ScanMaker E6	25 secs	45 secs
Mustek Paragon 1200SP	20 secs	35 secs
OpticPro 9630P	30 secs	55 secs
Primax Mediastorm 4800	15 secs	25 secs
Relisys Infinity Scorpio	10 secs	20 secs
Spot ScanTak 2c	55 secs	40 secs
Umax Astra 600s	28 secs	30 secs

Note: all test scans were done at 200dpi and 24-bit colour depth.

instructions. However, once installed, the Scantastic provides an excellent, simple desktop with options for a wide range of scanning tasks, including OCR, business-card scanning, copying and faxing. The bundled Easy TWAIN driver has a neat, attractive interface with basic but easy-to-use controls.

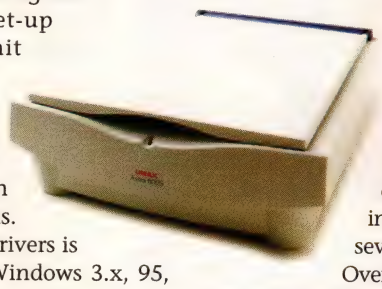
Apart from the software glitches, the other minor problems we found with this scanner are that it's slow and a little bit noisy. The image quality is also rather poor, and that would limit its possible applications, proving once again that you get what you pay for. Nevertheless, if your scanning requirements are as modest as your budget, this is a scanner well worth taking a look at.

- **Distributor** Magtron
- **Phone** (02) 9975 3727
- **Online** http://www.magtron .com .au/products_s .htm
- **Price** $250
- **In short** An innovative (but proprietary) design and a very low price make this a good choice for the price-conscious, but not if high image quality is vital.

Umax Astra 600s

UMAX

The Astra's documentation is clear and concise, with a clearly-illustrated packing list and straightforward set-up instructions. The unit comes with a SCSI terminator and the instructions for using it are clear, and include relevant information about SCSI IDs and chains. A comprehensive set of drivers is included, which covers Windows 3.x, 95, NT and Mac OS users.



Umax's TWAIN driver, Vistascan, has slightly more features than those supplied with many of the Astra's rivals, but the bundled PageImage editing software lacks an Acquire command, so you can't use the TWAIN driver to scan images straight into the image-editing program. Despite the fact that PageImage is part of a an integrated suite called PageManager (which includes OCR and image management capabilities), we found the lack of integration between the TWAIN driver and the other tools surprising. Apart from that, however, PageManager is a nice, simple program that allows you to add your own favourite applications to its 'scanning desktop'.

Scanning times were average but the resulting onscreen preview was quite impressive, and noticeably sharper and clearer than several of the Astra's rivals. Unfortunately, this onscreen quality didn't translate into print quality, and the Astra's scan looked distinctly muddy when printed, having rather flat colours and lacking in contrast.

The other aspect of this scanner that we weren't entirely happy with was its construction, which seemed slightly flimsy. Users will need to handle it carefully to avoid damaging it, particularly if it's installed in an office where several users are sharing it. Overall, a rather disappointing scanner with particularly poor software.

- **Distributor** Computer Enterprises
- **Phone** (02) 9807 5222
- **Online** http://www.umax.com
- **Price** $530
- **In short** Poor-quality scans are a turn-off.

Specifications: Scanners

Scanner	Distributor	Phone	Online	Price	Interface	Optical resolution (dpi)	Interpolated resolution (dpi)	Colour depth
Acer Acerscan 610 Plus	Servex Australia	(02) 9870 4823	http://www.servex .com.au	$479	SCSI	600 by 1,200	9,600 by 9,600	30-bit colour, 10-bit greyscale
Canon Canoscan 600	Canon Australia	(02) 9805 2864	http://www.canon.com.au	$799	SCSI	600 by 1,200	2,400 by 2,400	30-bit colour, 10-bit greyscale
Hewlett-Packard ScanJet 5P	Hewlett-Packard	(03) 9272 2659	http://www.hp .com.au	$599	SCSI	300 by 300	1,200 by 1,200	24-bit colour, 8-bit greyscale
Microtek ScanMaker E6	Proscan Australia	(02) 9904 1244	http://www.microtekusa .com	$799	SCSI	600 by 1,200	4,800 by 4,800	30-bit colour, 10-bit greyscale
Mustek Paragon 1200SP	Synnex Australia	(03) 9540 0555	http://www.mustek.com	$599	SCSI	600 by 1,200	9,600 by 9,600	30-bit colour, 10-bit greyscale
Plustek OpticPro 9630P	Creative Pacific	(02) 9906 888	http://www.plustek.com	$299	Enhanced Parallel Port (EPP)	600 by 600	9,600 by 9,600	30-bit colour, 10-bit greyscale
Primax Mediastorm 4800	BBF Components	(03) 9761 4299	http://www.primax.nl	$299	Parallel	300 by 600	4,800 by 4,800	No specifications available
Relisys Infinity Scorpio	Teco Australia	(02) 9765 8168	http://www.relisys.com	$799	SCSI	300 by 12,00	2,400 by 2,400	30-bit colour
Spot ScanTak 2c	Magtron	(02) 9975 3727	http://www.magtron .com.au/products_s.htm	$250	Proprietary	300 by 600	4,800 by 4,800	30-bit colour, 10-bit greyscale
Umax Astra 600s	Computer Enterprises	(02) 9807 5222	http://www.umax.com	$530	SCSI	300 by 600	4,800 by 4,800	30-bit colour, 10-bit greyscale

Note: All the scanners reviewed are flatbeds that complete their scans in a single pass.

Workshop

CONTENTS

Welcome to Workshop, the section dedicated to bringing you all manner of tips, interesting information and do-it-yourself tutorials. Within these pages you will find useful shareware, informative operating system specific columns and easy-to-follow programming tutorials.

The four sections of Workshop are Tech Talk, Operating Systems, Shareware and Programming. Tech Talk is a section for beginners, consisting of Technobabble, which explains technology for those not technically savvy, and a new column, Step by Step (starting soon), which will explain how to upgrade and improve your system.

Operating Systems covers the popular Windows 95, OS/2 and Mac OS operating systems, and the Shareware section contains useful or interesting software for each OS.

Programming features Developers Corner, which covers some of the issues involved with designing and developing software; JavaScript, which features tutorials aimed at teaching the essentials of JavaScript programming; and HyperText, previously known as Online, which covers the ever-diversifying art of Web page programming.

Get involved

All files mentioned in Workshop can be found on **apcmag.cd** or downloaded from our Web site at **apcmag.com**. Here you will also find a new online discussion forum where you can discuss technical issues or hardware problems, or just voice your opinion on any related topic.

Don't forget that Workshop is a reader input section. Feel free to contact us by sending any ideas, comments or criticisms you have. You can email us on workshop@acp.com.au or send snail mail to *APC* Workshop, PO Box 37, Sydney NSW 1028.

Ashton Mills, Workshop editor

Tech Talk

Technobabble takes a look at the most important piece of software you have on your PC — the operating system. This month Technobabble will be running online only. You can find it at **apcmag.com** in the Workshop section.

Operating Systems 163

Windows 95 covers a few simple and easy-to-implement performance tweaks, while OS/2 looks into the advantages of replacing the Workplace Shell. Mac OS delves into the topic of file translators and the many benefits they offer.

Programming 169

The third instalment of Developers Corner covers object-oriented programming and the many benefits it provides. JavaScript explains all about operators and how to use them, while HyperText analyses cookies and why, if used properly, they are a handy feature for the avid HTML programmer.

Shareware 175

Windows Shareware brings you a variety of programs to help upgrade Windows 95; OS/2 Shareware offers a selection of useful new and old software; and Mac Shareware takes a look at a few odds and ends, ranging from file utilities to games.

Win! Win! Win!

To complement the new Bug of the Month section of Developers Corner, Workshop is on the lookout for the most interesting, strange, funny or downright weird software bugs you can find. These include code snippets, examples of poorly working features or procedures on how to crash a particular application. Anything and everything that is buggy deserves mention.

Send us the bug of your choice via email (workshop@acp.com.au) or snail mail and you'll be in the running to win a copy of Microsoft's Visual Basic Version 5.0 Professional. Feel free to send screen captures or example code listings as well as how to duplicate the bug, if applicable.

Winners will be announced in the November edition of *APC* and the winning bug will appear in the Bug of the Month column. So get cracking!

Conditions of entry on page 237.

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This month we take a look at few easy ways to improve the use and performance of Windows 95. **By Ashton Mills**

Windows 95

When Windows 95 first graced our PCs we were treated to a relatively rich and versatile operating environment. Many of the new features were quickly adopted by users as they delved into what Windows 95 had to offer. However, as they delved deeper, some began to realise that many aspects of Windows 95 could be greatly improved, and it wasn't long before registry hacks and third-party utilities sprang up to do exactly that.

Apart from various shareware programs that can be used to enhance Windows 95 (previously reviewed in Windows Shareware), many of the better tips and tweaks can be easily implemented with just a handy text editor or a little expert knowledge. This month we cover a few of the methods used to improve the performance and usability of your Windows 95 machine.

Old-style views

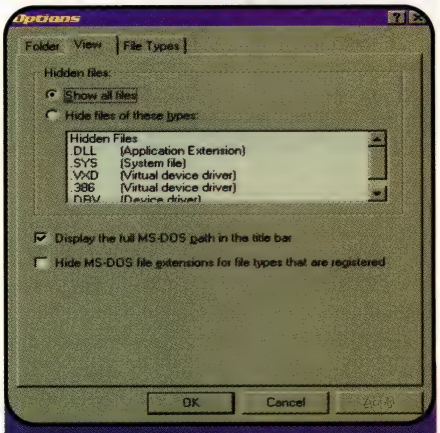
If you're used to having full control of your system and you find that Explorer is leaving out vital information from your directory listings, you can quickly and easily tell Windows that you want to see *everything* on your drives, not just a simplified view, by doing the following:

Open My Computer and select View, Details followed by View, Options. Click on the View tab and then select Show All Files and 'Display full MS-DOS path'. Make sure 'Hide MS-DOS extensions' isn't ticked. Click OK.

Resize the window to include all the columns you wish to see, expanding them as necessary. Once you're satisfied with the layout, hold down Ctrl and close the window. This saves the window settings for future use. Now every time you open up My Computer and explore any drives within, your tailored window format will be displayed.

Speedy navigation

This is more an aesthetic point than anything else. You can easily change the delay between selecting an item in the



Making sure you can view all file types.

Start menu and seeing the contents displayed. Simply open up your registry (start RegEdit) and search on the key:

HKEY_CURRENT_USER\Control Panel\desktop

and set the value MenuShowDelay to 200. The smaller the value, the faster submenus will display.

Saving cache

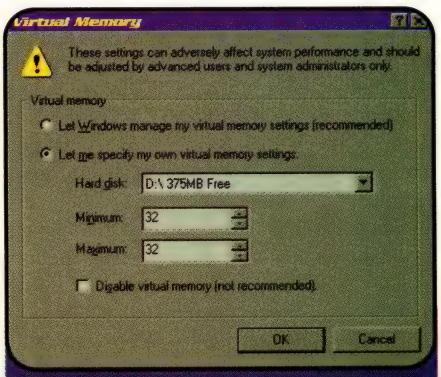
In an attempt to provide optimum disk throughput, Windows 95 dynamically sizes its internal disk cache — if programs require more RAM, Windows 95 will shrink the disk cache and make way for them. However, Windows 95 will attempt to allocate a large portion of your RAM to this disk cache, sometimes sucking up to 50% of RAM to be allocated as a cache. For some this may be excessive, especially if they want to keep as much RAM free as possible. More to the point, on low-memory systems the resizing may cause the cache to become so small that its benefit becomes negligible.

The solution is to force the size of the disk cache. Windows provides two parameters to do this: MinFileCache and MaxFileCache. By setting a minimum value you can ensure the cache will at least remain at a useful size, while setting an upper limit will ensure that you'll always have RAM free on your system.

To set these values, edit your SYSTEM.INI file located in your \windows\ directory. Find a subsection called [VCACHE] (create it if it is not present) and set the values as such:

```
[VCACHE]
MinFileCache=4096
MaxFileCache=4096
```

The above values represent a generous cache size for a 16M system. Depending on what type of applications you intend to run, you may want to increase or decrease this amount. On systems with over 32M, set the cache to 8M and leave it there (anything more than 8M doesn't offer a vast performance improvement). On systems of 8M or less, set the cache to 2M or 1M, but try not to go below 1M, as anything less is unlikely to be of benefit.



Forcing the size of virtual memory.

Smart swapping

Windows will also dynamically resize its virtual memory as required. Again, this is an intelligent feature — no more disk space will be taken up than is required — but resizing virtual memory is a slow process and is often the cause of disk thrashing. The solution is to force the swapfile size so that it doesn't resize at all:

Open up your Control Panel and click on System. Under the Performance tab click on Virtual Memory. Click 'Let me specify my own settings' and type in a minimum and maximum value for your swapfile, then press OK.

By forcing the swapfile size, Windows will be able to instantly read and write to your virtual memory without spending time resizing it. Moreover, if you defragment your drive after your new swapfile is created the file will be contiguous, giving you a speed benefit not normally possible with a dynamically-sized cache split over your drive.

Generally you should set aside around 32M for a swapfile on a system of 16M or more, and consider raising it only if you have less than 16M or if certain programs require an exceptionally large swapfile.

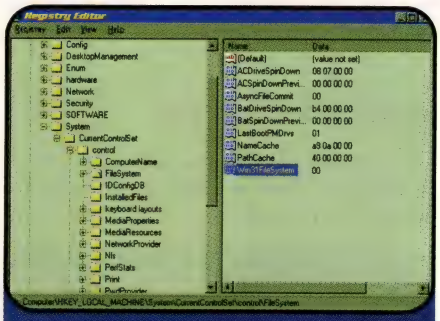
You should also give some thought to where you place your swapfile. As a general rule — and this applies to all operating systems — you should place the swapfile on the *most used partition* of the *least used drive*. By doing so, you ensure that the swapfile is always quickly accessible. Obviously, if you only have one drive you can't do this. But if you have more than one drive, it's a good idea to place your swapfile on a drive other than that which you use to boot Windows. You'll be surprised at the vast performance boost this simple logic will provide.

Remembering the 8.3

This next tip is provided for those who use other operating systems alongside Windows 95 on their machine. Although Microsoft tried to advance Windows 95's file system to a level equal to that of NT or OS/2 by implementing the VFAT file system, it didn't do so very efficiently. Long filenames are stored in the directory structure of your FAT drive — fine if all you use is Windows, but other operating systems (such as OS/2 or Linux) have some trouble with it. Actually, it's more the other way around — Windows has a problem with files written to its FAT drives by operating systems other than Windows, since these operating systems obviously don't support VFAT and won't update the directory structure the way Windows expects.

There are two ways around this. One is to ensure that your other operating systems don't write to a Windows VFAT drive (not really an option). The other is to tell Windows to revert back to the old FAT system used by DOS (and generally understood by all operating systems).

The betas of Windows 95 had this as an option during the installation process,



Finding the elusive 'Win31FileSystem' key.

although this 'Windows 3.1 file system' compatibility, as Microsoft calls it, was removed for the release. You can disable long filenames and force Windows to use the 8.3 DOS convention as follows:

- Run the LFNBK utility that comes with Windows to back up all your long filenames. If you do have a problem, you'll want to be able to restore things to their former state.
- Run SCANDSKW /O to remove long filenames from your drive.
- Open up your registry and find the key:

Hkey_Local_Machine\System\CurrentControlSet\Control\FileSystem\Win31FileSystem

and set it to 1.

Take note, however, that some Windows 95-specific programs might have problems finding files on your drive. Many Windows 95 applications opt for long-name directory structures during installation. These can, of course, be changed, but if you decide to revert to the 8.3 FAT file system it might be a good idea to perform a clean install of Windows and your applications on it, installing all applications in 8.3-compliant directories. While it's handy to keep an entire system using the 8.3 convention on all your FAT drives, this method of file storage under Windows 95 is not supported by Microsoft and it's possible not all Windows 95 programs will appreciate your dedication to this older method of file storage.

Speeding up TCP/IP

If you're using PPP (Point to Point Protocol) to connect to the Internet, you can squeeze a slight performance benefit by tweaking the MTU (Maximum Transmission Unit) size used by PPP. Normally this defaults to 1,500, but increasing this to 4,000 can result in a small speed improvement.

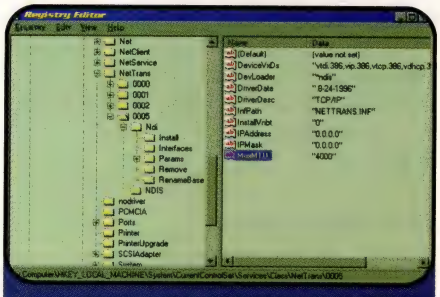
Dial-up Networking doesn't provide an option to easily change PPP parameters, so you'll need to edit your registry and look for the following key:

HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\Class\NetTrans

where you should find a number of protocols listed, one of which will be TCP/IP (such as \NetTrans\0005\). Simply look for 'TCP/IP' as the value for the entry 'DriverDesc'.

Select New from the Edit menu, then select String Value and type 'MaxMTU'. Double-click on the new entry and give it a value of 4,000.

It's a good idea to experiment with different MTU sizes, and use the one that gives you the best performance increase. If you find you're having problems locating sites



Adding the 'MaxMTU' variable to the registry.

or, in fact, your performance degrades, you can set the MTU back to the default of 1,500.

Playing it safe

It goes without saying that you should always back up your registry before making any changes. This is easily done by simply copying the files SYSTEM.DAT and USER.DAT (found in your \windows\ directory) to a back-up directory. Note that these files are hidden, so you'll need to follow the instructions given in the tip 'Old-style views' above so you can see hidden files in Explorer.

Should anything go wrong, you can boot to DOS and copy your back-up files to your \windows\ directory and reboot.■

Sometimes you want the power OS/2 offers, but not all the fancy trimmings. Using a shell replacement allows you to take advantage of OS/2's capabilities on hardware-constrained systems. **By Ashton Mills**

OS/2 Warp

For many OS/2 users the WPS (Workplace Shell) is the only operating environment they know, or more to the point, the only environment they need. For those not savvy with the WPS, it's the user interface that sits between you and OS/2, giving you access to the objects and folders you use every day.

However, the WPS isn't the only shell you can run in OS/2; there are a number of freely available shells you can use instead. Why would you want to change the shell? I'm glad you asked.

Considering the change

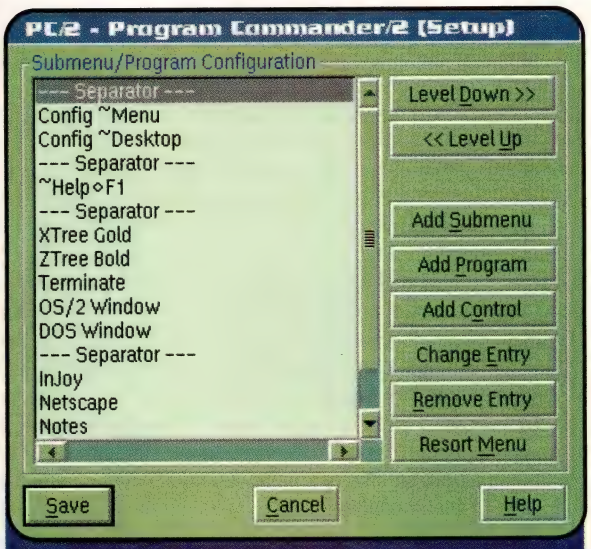
The WPS, for all of its impressive functional glory, is a beast. This is to be expected — a fully-featured graphical environment is going to take up space, no complaints there, but what if you don't have space to spare? Enter the shell replacement.

It comes as no surprise that many people still use their ancient and aging hardware and view it with pride. Sometimes the work environment forces users to make do with what they have, and in these circumstances every byte of memory and disk space count. Using a replacement shell in OS/2 can slice off a massive 4M or more from your run-time environment.

Don't get your hopes up yet, though. The more functionality you demand, the more space you can expect to take up. While a replacement shell offers a smooth operating environment by being less demanding on your hardware, what you can do in your shell is likely to be limited. But if all you require is a limited environment, switching shells is definitely the way to go.

There are a number of reasons, aside from performance issues, for using a different shell. An ideal application for a smaller and less functional shell is for your maintenance partition, if you have one. You may only require a text-based or less fully featured environment to perform your tweaking and tailoring. Taking this a step further, the most obvious application for a replacement shell is on an OS/2 boot disk. Since many OS/2 users keep an OS/2 boot disk (or two) handy for emergencies and those times when they want to defragment their primary partition, it makes sense to give the boot disk a little more power than CMD.EXE offers.

On a larger scale, shell replacements can act as security barriers for administrators setting up OS/2 client machines. Take away the WPS and you take away access to some of the more sensitive areas of a client machine. Not only is the act of using a replacement shell secure (since the new shell is likely to be limited) but some shells, such as FileBar (see next page), also include security features that affect the shell and the applications themselves.



Configuring the program menu in PC/2.

In fact, shells such as FileBar offer an amazingly versatile operating environment to work in. You may not necessarily lack any particular function, yet you can still save large amounts of memory, and thus increase performance. Why bother wasting memory on the WPS if all you want is an OS/2 box to act as an Internet gateway or BBS server? By reducing the requirements needed to run OS/2 and your applications, you can spend less on hardware and thus save money. Or, more to the point, make better use of aging hardware. OS/2 is a remarkably efficient server platform for low-specification machines if configured properly. The biggest possible RAM saver and tweak you can make in these instances is to replace the WPS with another shell.

Making the change

There are a number of issues to consider when deciding to change shells. For a start, make sure you haven't saved any documents in your WPS that aren't currently stored in a file somewhere. You won't be getting access to your OS2.INI and OS2SYS.INI files, so any objects stored there won't be available to you. Taking this consideration a step further, you also won't have your files and utilities easily accessible though folders, so again be prepared to become accustomed to your new shell by taking note of the applications you intend to use.

Next, it's important to gain a little understanding about how OS/2 handles shells. There are four commands in your CONFIG.SYS that tell OS/2 what type of shells you want to use and how to use them:

PROTSHELL specifies which program you'd like to use as a *session manager*. By default this points to PMSHELL.EXE.

RUNWORKPLACE specifies which shell you'd like to run as your workplace. This also defaults to PMSHELL.EXE.

OS2_SHELL specifies which program you wish to use as an OS/2 command-line interpreter. This defaults to OS/2's standard interpreter CMD.EXE.

SHELL specifies which program you wish to use as a DOS command line interpreter. This defaults to OS/2's DOS interpreter COMMAND.COM.

Most shell replacements you install will ask you to replace the RUNWORKPLACE variable, but not the PROTSHELL setting. This means that, even though you might elect to boot a different shell, you're still running PMSHELL.EXE. This may seem strange,

Tip of the Month

Just when you thought you knew all the undocumented switches for HPFS, along come two more! Yes, functionality abounds with this beloved file system, and now you can force some of it to kick in when you want.

As you know, OS/2 will only force a CHKDSK on a drive if it detects that the 'dirty bit' is toggled on the drive, meaning OS/2 wasn't properly shut down and it's possible that file errors could exist. In this situation, CHKDSK is automatically run next time you boot up. But what if you suspect there might be errors that need fixing and you want to run a full CHKDSK? Normally this is impossible because drives become 'locked' once OS/2 has booted, and any corrections CHKDSK wants to make can't be made.

To force a CHKDSK on your drives, simply edit your CONFIG.SYS and add a '+' in front of those drives you want checked in the AUTOSTART list:

```
IFS=D:\OS2\HPFS.IFS
/AUTOCHECK:+C+D+E
```

When you next reboot, your drives will go through the rigorous CHKDSK procedure. Note that this little tip works for your FAT drives too. Just place a '+' in front of the drive letters in the AC (autocheck) list in the DISKCACHE line.

but there's a good reason. PMSHELL acts as both the session manager and the WPS, and is the key to running PM applications. It's possible to replace PMSHELL.EXE as your PROTSHELL but the replacement shell must have session-management capabilities. Doing so will save you even more RAM for a memory-constrained system.

The OS2_SHELL and SHELL settings obviously don't affect which WPS replacement you decide to boot (unless you choose to boot to a command shell), but they do allow you to further enhance your operating environment. For example, a common CMD.EXE replacement for OS/2 sessions is YAOS (Yet Another OS/2 Shell) or 4OS2 (reviewed in this month's OS/2 Shareware, on page 177). Both of these shells offer major feature enhancements over the standard CMD.EXE. In OS/2 this is always a benefit for those used to the command line, but if you elect to boot to one of these shells instead of the WPS, booting to a plain command line won't leave you pining for a more versatile environment.

Three available options

Replacement shells generally cater to a specific environment. The following freely available shells will each save you RAM if used as a WPS replacement, and each offers a different level of functionality. All can be found on this month's **apcmag.cd**.

T-Shell

T-Shell is a complete, text-based WPS and session-manager replacement (installed by replacing the PROTSHELL variable). Being text based, T-Shell has a minute footprint, saving you a vast amount of RAM compared to PMSHELL and the WPS. In fact, T-Shell claims that when it's used as your default shell you can operate OS/2 on a 4M system with a minimal swapfile. However, as you would expect, this gain comes at a cost.

Functionally, T-Shell is basically a full-screen session manager. You can run full-screen OS/2, DOS and Windows-OS/2 sessions with ease, but you have to switch between them. And, because T-Shell replaces PMSHELL, you can't run PM applications. Still, if you all you need to run are text-based OS/2 or DOS applications, and RAM is a rare commodity, T-Shell will allow you to run an efficient OS/2 system.

FileBar

FileBar is akin to the Windows 95 Start bar and Warp's Warpcenter. A menu bar is placed at the top of the screen that gives easy access to a tailored list of programs and features, limited by security if desired. Since FileBar is a shell replacement (installed by replacing the RUNWORKPLACE variable) it is fully capable of launching both DOS and Windows-OS/2 sessions as well as OS/2 VIO and PM sessions.

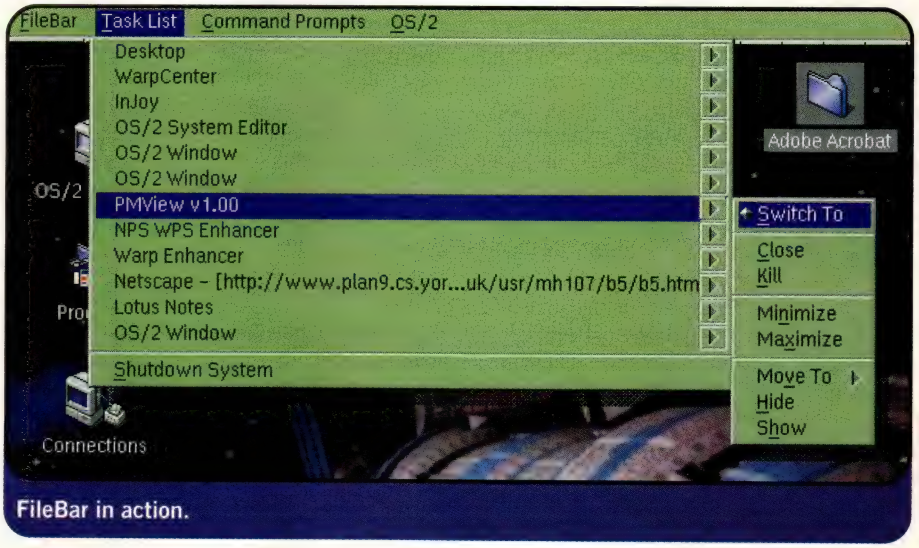
The latest version also adds support for virtual desktops, giving you a choice of 'screens' in which to launch applications. You can switch between 'desktops' at will, allowing you to easily run and manage more programs than you have screen real estate to cater for.

FileBar has a very small footprint and when used as a WPS replacement will give you a fair amount of memory in return. If, however, you find the need to access WPS objects, you can even start the WPS as an application from within FileBar.

PC/2

Program Commander (previously reviewed in OS/2 Shareware) acts as a one-click menu system for OS/2, giving you access to a tailored list of programs. This same menu is used as a WPS replacement, so it's a good idea to run PC/2 under a normal OS/2 boot and use the PC/2 utilities to configure a menu will all the programs you expect to use.

Like FileBar, PC/2 also gives access to virtual desktops, allowing you to specify the size of your work area and whether it should be 'scrollable' or not. PC/2 offers many other features such as Z-ordering and the ability to specify the priority levels of programs in the menu list. Both FileBar and PC/2 are ideal as a shell replacement to save RAM while offering detailed functionality.■



FileBar in action.

Translators can save time and effort when it comes to reading document formats. **By Stephen Withers**

Mac OS

Of course we believe in standards — 'the more standards the better!' is one of the more enduring remarks in IT mythology. The first time I heard it used was in the context of networking, but it applies equally to most other aspects of this industry.

The point is that everyone and their dog thinks they know the best way of performing a particular function. Sometimes the industry falls in behind an approach or technology (TCP/IP and associated protocols are a prime example); sometimes a product dominates a category (for example, Microsoft Word) to the extent that those offering alternatives must provide at least a degree of compatibility.

This is especially true with file formats. Apart from the basics such as PICT and text files, almost every application for creating files has its own native format. Some other formats — such as HTML, GIF and JPEG — can fairly be regarded as universal. It is no coincidence that these are associated with the Internet.

Even where standards are used, the result may not be satisfactory. A clearly visible parallel (assuming you are using a different program) is the email message exploiting the more advanced capabilities of Cyberdog or Netscape. The text of the message is there, but it's interspersed with tags.

When you're not using the same program as the other guy, you have two choices: fall back to a simpler or more broadly supported standard, or use some kind of file translation.

Interchange formats

The simplest formats use text files. Simplest of all are plain text files, which consist of a stream of ASCII characters, but even these aren't universal. Is the character set the 'normal' 7-bit ASCII, the extended set used by Macintosh and Windows (they're not the same, as you discovered the first time a Windows user sent you email containing curly quotes), or an encoding other than US English? Is the end of each line (or paragraph) marked with a carriage return, a line feed, or both?

Some word processors — notably Word — support 'text with layout' where extra spaces are used to represent paragraph indents, margins, tables, and so on. This works best with monospaced fonts, but can be useful when transferring blocks of text to applications that don't support styled text.

Slightly more sophisticated are the tab or comma-delimited files used as a *lingua franca* for databases and spreadsheets. They transfer the actual data, but much of the richness is lost, including all the formatting information and details of the structure (such as relationships between tables in an RDBMS, or the formulas within a spreadsheet).

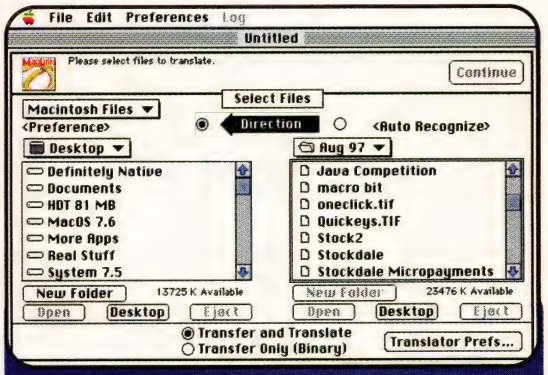
It is possible to represent rich data with a text file. HTML is a current example, though it is insufficiently rich to be used as an interchange format. Formats such as RTF (Rich Text Format) for word-processed files and SYLK (SYmbolic LinK) for spreadsheets are widely supported and preserve most — but not necessarily all — of a document's formatting and structure.

As far as graphics are concerned, most Mac applications support one or more of PICT, TIFF and EPS, while GIF is becoming increasingly common. In most cases, there will be a format usable by both the creator and user of the image, though vector formats may present problems.

Translators

There are basically three types of file translators: import and export filters for specific applications, system-level utilities, and standalone programs. Each has its advantages and disadvantages, but you should keep in mind that particular products may fit into more than one of these categories.

Filters are written to allow an individual program to read or write files in the format used by another application. An example is QuarkXPress' support for files created by Microsoft Word and other word processors. Generally speaking, they are written by or for the program's vendor, and may be version-specific. This means they can do a very good job, as the developer can target all the relevant information in the file format, mapping it to or from the corresponding features of the program. In the above example, when Quark encounters a Word style, a pre-existing style with the same name overrules it. This makes sense in this context, as people creating the text in a word processor can use fonts and sizes that display clearly onscreen (12-point Espy Serif, perhaps), but when loaded into Quark it is automatically converted to those used in print (say 9-point Stone Serif). On the other hand, it is appropriate to maintain the appearance of the document when moving between two word processing programs, and that's generally what happens.

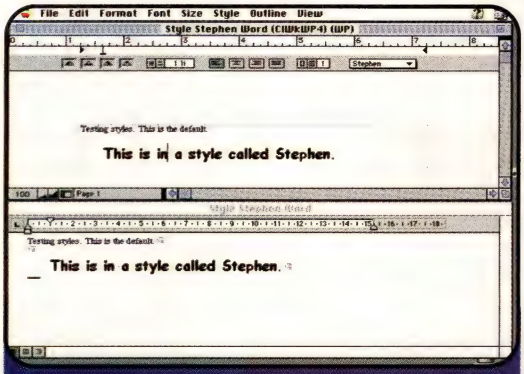


MacLinkPlus/Translators works well, but has an unexciting interface. Use the drag-and-drop Document Translator for your regular conversions.

XTND is the primary technology for system-level file translation. Created by Apple and later transferred to Claris, XTND integrates file translation with the normal Open and Save as dialogs. XTND-savvy programs such as ClarisWorks and Nisus Writer add a pop-up menu to these dialogs allowing the use of any installed XTND translators.

The XTND engine (called Claris XTND System) is normally found in the Claris folder within the System Folder. A folder called Claris Translators will be found in the

same location, and contains the XTND translators themselves. If many translators are installed, it becomes tedious to scroll through the pop-up menu each time you perform a 'Save as'. Avoid this by creating a folder outside the Claris folder (perhaps calling it 'More Translators') to contain the translators you rarely use. Its contents won't show up in the menu, but you can quickly restore any translator that you suddenly need. If you create More Translators as a subfolder of Claris Translators, the modules it contains will still be detected by XTND, along with any translators in the Claris folder. A convenient strategy for those using StuffIt Deluxe's True Desktop Integration feature is to drag the extra translators in and out of a StuffIt archive kept within the Claris Translators folder. Standalone programs for file translation include Apple File Exchange (now obsolete, but still in use by those who have chosen not to upgrade the system software on old Macs), MacLinkPlus/Translators and StuffIt Deluxe.



MacLinkPlus/Translators help maintain the integrity of a converted document by handling styles as well as the underlying attributes.

Apple File Exchange was the company's early way of providing compatibility with DOS and ProDOS (Apple II) diskettes, and included very limited file-translation capabilities. Additional translation modules were available from third parties.

Apple currently bundles DataViz MacLinkPlus/Translators with the system software (7.5 and later), but consider upgrading to the latest version of MacLinkPlus (Conexus, [02] 9975 2799, http://www.conexus.com.au) for new features and bug fixes. Mac OS 7.6 comes with Version 8.1, yet Version 9.0 has been out for some time. Among the recent features are the ability to convert Web pages including graphics into word processor documents, and a utility that displays the text contained in files of arbitrary types.

MacLinkPlus/Translators provides an application (MacLinkPlus) for conversion and also links to XTND by installing a 'bridge' which allows the latter to use the translators in the DataViz folder within the System Folder. There's a definite performance penalty involved — on my system, the Open dialog takes twice as long to appear in XTND-savvy applications if the bridge file is in the Claris Translators folder. If you rarely need the additional MacLinkPlus translations, you might be better off removing the bridge and relying on the application to translate files when necessary.

Regardless of the way translation is specified, the same translators are used for any pair of formats. As far as word processing is concerned, DataViz provides two levels of feature support. Level 1 covers the basics such as character attributes (size, bold, underline, and so on), left, right and indent margins, line spacing and tabs. Newer programs are supported to Level 2, which includes colour, date and time, tables, columns, footnotes and end notes, headers and footers, page-setup settings, hidden text, page numbers, style definitions and tags, and top and bottom margins.

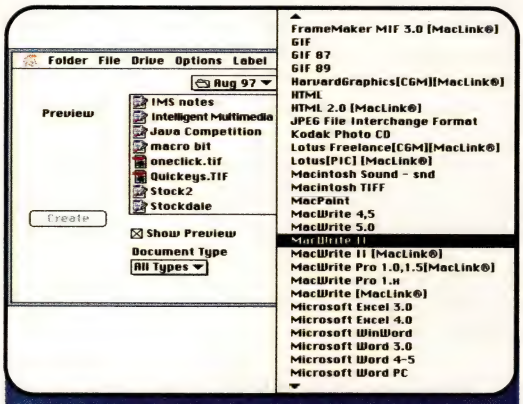
MacLinkPlus handles more than just word processed files. Translators are included for spreadsheets (Excel, Lotus 1-2-3, ClarisWorks), databases (dBase, FoxPro) and graphics (TIFF, BMP, WMF). As you can see from those examples, Mac and PC formats are supported.

If you regularly need to convert files to a particular format, take advantage of MacLinkPlus's Document Translator feature (called Document Converter in the manual). A Document Translator is a tiny file (less than 4K) that works in conjunction with Mac OS Easy Open to convert any document dropped onto it into a preset format.

To set up a Document Translator, simply copy the one in the MacLinkPlus folder to a convenient location — typically the desktop. Set the conversion type by double-clicking on the Translator and picking from the list of available converters. This automatically gives the Translator an appropriate name. In case you end up with multiple Document Translators on the desktop, it wouldn't hurt to give each a custom icon. I'd superimpose a large arrow on the icon for the target document type. Now you can drag and drop one or more files and/or folders onto the Translator and the documents will be converted to the specified format.

Earlier versions of MacLinkPlus included External Converters (ml files) that extended the range of conversions available from Word's Open and Save as dialogs (Word is not XTND-savvy). According to DataViz, this mechanism cannot handle the complete feature set of its latest translators and was dropped from Version 9.0. Although the latest installer is supposed to remove old MacLinkPlus ml files, it isn't 100% reliable in this regard, so Word users should check the Word Extensions folder after installing MacLinkPlus 9.x.

Word for Word is not as well known as MacLinkPlus, but some say it does a better job of converting word-processed files from one format to another. However, I have no personal experience of this product. It was acquired from Mastersoft by Adobe, which sold it as part of Adobe File Utilities. Earlier this year it changed hands again, this time to Inso, which "temporarily discontinued" the product pending reintroduction "at a later date" in a "new and improved" form.



The combination of XTND and MacLinkPlus allows applications to open a wide variety of file types.

StuffIt Deluxe isn't really a file translator in the same sense as the other products mentioned here, but I include it for completeness because, apart from its primary function of file compression and archiving, it can read and write a variety of archive, compression and encoding formats which aren't native to the Mac, including Arc, tar, UUcode and Zip. In addition, its text converter takes care of the differences in text file conventions between Mac, PC and Unix. A variety of other applications handle specific formats, but I know of none that combines as many as StuffIt Deluxe.■

Workshop

To overcome the problem of program complexity, you first must learn to think in objects. **By Michael Smith**

Developers Corner

A short history

In the beginning computers were small (in capacity), and programmers were obsessed with minimising size and execution time, and ease of maintenance was not on the agenda. Then gradually programs got bigger and more complex, and managers began to realise that maintaining software was costing more than creating it. And so *structured programming* was born. Programs were broken up into small, manageable modules and with it the phrase *code reuse* was born. Yet the problem did not go away.

Then *object oriented* became a buzzword. Object oriented programming was going to solve all of our problems, reduce development costs and slash maintenance. There was only one problem: nobody knew what it was. Every product was object oriented — forests full of trees gave up their lives to produce endless books on the subject — but costs kept rising.

Over time things settled down. First *client/server* and then *Internet/intranet* replaced 'object oriented' in the current vernacular. Multi-megabyte software regularly ships months, sometimes years, late, then crashes daily. Yet among the chaos there are many success stories, and object oriented methods have contributed to some of that success.

Definitions

So what does 'object oriented' mean? At its fundamental level it's relatively simple. It means 'oriented around objects', or organised using objects as a basis. What is an 'object'? It's a thing. A button on the screen is an object. A table in a database is an object. For that matter, a database is an object.

A traditional structured program is linear in nature, set out a little like a recipe. The code is in one place, the data in another, and the whole thing runs from start to end. In an object oriented program you organise the problem into self-contained objects consisting of data and code, and then define interactions between those objects. Each object has an *interface* which is visible to the outside world, and the rest of its workings are *encapsulated*, which means hidden from the outside.

There are all sorts of neat tricks which can be done with objects, such as inheritance and polymorphism, but these are not essential for object orientation. Some programming languages offer inbuilt support for object oriented features, for example C++, Smalltalk and Delphi. It is still possible, and often desirable, to use object oriented methods over non-object oriented languages such as C, Fortran and Pascal. However, for the purpose of this month's column, we will use C++ for examples.

Basic anatomy of a C++ class

```
class Person {
private:
        char *Name;
public:
        Person( void ) { Name = NULL };
        ~Person( void );
        char *GetName( void );
        void SetName( char *n );
}
```

The class Person is a base class — it is not derived from anything. It has private properties, which are hidden from the outside world (encapsulated), and public properties, which are accessible. The method Person is the 'constructor' which is automatically executed when a Person object is created. It performs basic initialisation. The method ~Person is the 'destructor' which is automatically executed when a Person object is destroyed. It performs any necessary cleaning up. The constructor Person() has the code supplied inline, that is, it is present in the definition. This is only done for small, simple methods. The other methods would be implemented elsewhere in the project.

```
class Employee : public Person {
private:
        int EmployeeNumber;
public:
        Employee( void );
        Employee( int num, char *name );
        ~Employee( void );
        // Plus other properties?
}
```

The class Employee is a derived class — it is derived from the base class Person. An Employee inherits all of the properties of a Person, then extends them in ways specific to its own particular needs.

Notice that there are two different constructors, with different numbers of arguments. This is known as function overloading. It can be applied to any method in C++.

If you declare two employees:

```
Employee e1;
Employee e2( 10562, "Fred Jones" );
```

Creating e1 will execute the first constructor and creating e2 will execute the second.

You can also define a special type of constructor called a copy constructor which takes an object of its own class as an argument.

For example:

```
Employee( Employee& e );
```

If a copy constructor is defined, you can then perform simple assignments. For example:

```
Employee e3;
Employee e4( 75943, "John Brown" );
e3 = e4;
```

Bug of the Month

One of the perceived benefits of code reuse through effective application of object oriented methods is code consistency. If you evaluate something in two different places you expect to get the same answer. If each of the two different places calls a common routine then the chances are pretty good that you will. If the routine is duplicated, there's a chance for inconsistency.

A case in point: the DOS commands DIR and DEL both support wildcards. It has long been considered good practice before deleting something with a wildcard to test that wildcard in the DIR command. First type DIR [wildcard], and examine the listing to make sure that you see the files you expect. Then type DEL, followed by [F3] which produces the command DEL [wildcard]. You can then be quite sure of what you are deleting.

Or can you?

Under the Windows 95 command prompt, create three files: abc, abcd, abce. Type:

```
DIR abc?
```

You will see only two files listed — abcd and abce.

Now type:

```
DEL abc?
```

All three files will be deleted.

DIR interprets '?' differently from DEL! DIR interprets '?' as 'Exactly one character', while DEL interprets it as 'Zero or one characters'. Seriously nasty!

Why object orient?

So, as a developer, what's in it for you? The number one reason is to manage the program complexity. We know that complexity is a major source of program errors, and thus a major cost factor for maintenance. Breaking the program into smaller units helps with this, but problems occur with the interdependence of program segments. Often a small change in one segment will break several other segments. This can be solved by the object oriented method of 'encapsulation'. All of the internals of an object are kept hidden. The interface is well documented, and that is the only way any other program segment interacts with the object. You may happily change the object's internal workings. As long as the interface doesn't change, the rest of the program is unaffected.

Consider the OO_TEST example project on this month's **apcmag.cd**. The GraphicScreen class, declared in GRAPHSCR.H, contains all compiler-specific graphics code. You can change this class to work for another compiler or even another platform without having any effect on the rest of the program. If you need to change the interface, that will affect the rest of the program, but the interface is simple and clearly defined, so the changes to the rest of the prgram may be easily located and executed.

Effective code reuse is another major benefit of object oriented methods. In a software project you generally find that problems recur. Whether I'm sorting a list, reading a file or computing statistics, I frequently find I have done it in an earlier project and I'll often have to do it multiple times in the current project. In a perfect world you would simply put the solution in a library and forever more you just have to use the library. However, it's not a perfect world. The sort code from last time won't work here because the structures have changed. There's always a reason why the library code won't *quite* work this time. You finish up with many copies of the same code, each with a slight variation. Someone finds a bug in the code and you have to fix it in many places. The probability of getting it wrong is pretty high.

The object oriented solution is *inheritance*. You can define a *base class* with all of the common properties. For each variation, you create a *derived class* which inherits all of the properties of the base class, but can then add new properties or change inappropriate properties.

In the OO_TEST example project the GraphicObject class acts as the base class for all types of graphic objects. The Square, Circle and Triangle classes each inherit their basic properties from the Graphic Object class, then add properties specific to their own type of graphic objects.

Polymorphism is one of the more valuable tools used to reduce the complexity of a program. If you declare a pointer to a base class object, the pointer may actually be used to point to an object of any class derived from that base class. When you call methods for the object, if the method has been replaced in the derived class, that new method is used.

Consider this slightly modified version of OO_TEST.CPP from the OO_TEST example project on **apcmag.cd**:

```
int main()
{
  GraphicScreen screen;
  GraphicObject *objects[NUMEL];
  int i;
  Random r;

  for (i=0; i<NUMEL; i++) {
    // Note (1)
    objects[i] = RandomObject( r, screen );
  }
  for (i=0; i<NUMEL; i++) {
    // Note (2)
    objects[i]->Draw();
  }
  // etc . . .
}
```

At **(1)** the function RandomObject() allocates an object of type Square, Circle or Triangle; never a generic GraphicObject. At **(2)** when the Draw() routine is called, the correct Draw() method is called for each Square, Circle or Triangle.

Consider how much extra complexity would be required for the drawing loop if it was necessary to continually test for what type of object it was and call a different draw routine. Not to mention the extra complexity in managing the storage of the objects if you could not use a generic array. Now think about a graphical editor with dozens of object types and hundreds of graphical operations. The difference in program complexity becomes enormous.

What's the catch?

With object oriented programming the catch is performance. In making the program much simpler for you, you make it much more complex for the compiler. The result can be a program that takes longer to compile, and runs slower. Today, with blisteringly fast processors, many megabytes of memory and very sophisticated optimising compilers, the difference is getting harder to spot. For almost all practical purposes the overhead is insignificant and the benefits clearly outweigh the costs.

Object oriented programming isn't the answer to every problem. There are always problems which simply fit better into the 'recipe' format of programming. However, once you start thinking of the world in terms of objects, object oriented solutions seem natural.■

In this month's JavaScript column, we take a look at JavaScript operators and how to use them. **By Travis Simon**

JavaScript

An operator is a special character (or character grouping) that causes the computer to perform a specific action, such as addition. We've already seen the assignment operator (=) that assigns the value on its right-hand side to the variable on its left-hand side. Other operators include the mathematical operators: +, -, *, / and % for addition, subtraction, multiplication, division and modulus respectively.

JavaScript, like many other programming languages, doesn't treat division the same way that your grade six maths teacher did. In JavaScript, division is separated into two separate operations — one to divide, and one to get the remainder (the modulus operation). Using the division operator, the results are much as you would expect them to be. However, the modulus performs the unique task of extracting a whole number remainder. For example, 10%3 is equal to one (three goes into 10 nine times with one left over). Similarly, 7%3 is equal to one.

Recalling the assignment operator (=) which assigns the value on its right-hand side to the variable on its left-hand side, the syntax for arithmetic operators is:

```
variable = operand operator operand;
```

or

```
total = x + y;
```

Unary operators

A unary operator works on a single operand (or variable). The three unary operators are increment (++), decrement (--) and the negation operator (-). The increment operator will increase the variable by one, and the decrement operator will decrease the value by one. Used in an assignment statement, however, the increment and decrement operators will allow you to specify whether the variable is to be changed before or after the assignment operation.

The two modes for the increment and decrement operators are prefix and postfix modes, which have the syntax of:

```
variable++ (postfix)
and
++variable (prefix)
```

In postfix mode, the variable is incremented after the assignment is made. The code

```
y = x++;
```

would assign the original value of x to the variable y, and then add one to the value of x. On the other hand, the code

```
y = ++x;
```

would increment the value of x first, and then assign that value to y. In the first example, x is going to have a value one greater than y. In the second code, however, both variables will have the same value.

Finally, the negation operator (-) simply causes a variable to change signs. If 'myVariable' has the value of -5, '-myVariable' would be equal to five.

Compound assignment operators

Often in programming, it is necessary to perform an operation on a variable and store the value in the original variable. For example, you might want to multiply a variable by five. Using the assignment operator, you would type:

```
myVariable = myVariable * 5;
```

However, JavaScript has a shorthand notation that combines the mathematical operators and the assignment statement. The syntax is

```
variable (op)= operand;
or
myVariable *= 5;
```

This example is the same as 'myVariable = myVariable * 5'. This notation can be used for any of the operators.

Comparison and logical operators

A comparison operator is used to test for a certain relationship between its two operands. If the designated relationship exists, the comparison operator will return True. Conversely, if the two operands don't share the designated relationship, the comparison operator returns False. Using comparison operators, you can test for equality (==), greater than (>), less than (<), greater than or equal to (>=), less than or equal to (<=) or not equal to (!=) relationships. Consider the following examples:

1 == 1	returns True — one is equal to one
2 < 5	returns True — two is less than five
6 >= 9	returns False — six is not greater than or equal to nine
4 != 3	returns True — four is not equal to three

It is often necessary to check whether a more complex situation exists, requiring that one of two relationships, or both, exist. To construct more complex conditional expressions, you have to use logical operators. JavaScript has three logical operators, logical AND (&&), logical OR (||) and logical NOT (!).

The logical operators require that their operands be Boolean (True/False) values. The logical AND returns True if and only if both operands are true. The logical OR, however, will return True if either operand or both are True. The following examples will illustrate the use of the logical operators:

True && True	returns True — both operands are true
False || False	returns False — neither operand is true
!False && True	returns True — both operands are true (!False is equal to True)
False && True	returns False — one operand is False
(2 > 5) || (5 <= 10)	returns True — one operand is True (five is less than or equal to 10)

The IF statement

On their own, the comparison and logical operators seem to be of little or no use. However, the ability to make decisions based on the current program state (conditional branching) is what separates computers from calculators and televisions. The simplest branching mechanism is the 'if' statement, whose syntax is:

```
if(condition)
        Statement;
```

The 'if' statement evaluates the condition, and if it's True, the statement is executed. If the condition is False, however, the statement is skipped and execution moves to the next statement in the program. The condition can be generated using the conditional and logical operators, providing a powerful means to alter program execution. For example, the following code produces the absolute value of a variable:

```
if(myVariable < 0)
        myVariable = -myVariable;
```

Often, your program code has to handle one condition one specific way, and handle all other cases another way. To accomplish this, the 'if' statement can also be constructed with the optional 'else' statement. The syntax for an if/else condition is:

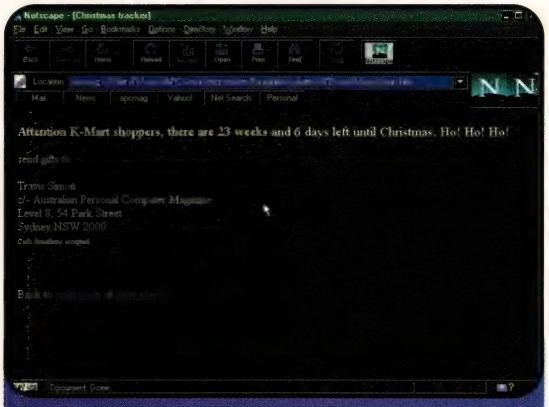
```
if(condition)
        Statement1;
else
        Statement2;
```

If the condition is True, Statement1 is executed. If the condition if False, Statement2 is executed.

A common use of this construct is in division. In JavaScript, attempting to divide by 0 will produce an error. To avoid producing this situation, you could use the following code:

```
If(denominator == 0)
        {
        alert("Attempting to divide by zero.
Please try another value");
        total = 0;
        }
else
        total = numerator / denominator;
```

In this example, if the denominator is 0, we need to alert the user and avoid attempting to divide. In all other cases, we go ahead and perform the division. Notice that in the case where the denominator is 0, we actually need to execute two statements, so we have to group them together with brackets.



Our Christmas tracker in action.

Sometimes, however, we have more than two cases that need to be handled. To accomplish this, we must use nested 'if' statements. The syntax for nested 'if' statements is:

```
if(condition1)
        statement1;
else if(condition2)
        statement2;
. . .
else if(condition_n)
        statement_n;
else
        generic_case;
```

By using nested 'if' statements, the conditions are mutually exclusive. Once one of the conditions has been satisfied, control will move to the next statement, past the 'generic_case' statement. If you use a series of 'if' statements without nesting them using the if/else syntax, each condition will be evaluated, and any condition that returns a True value will be executed.

Operator precedence

Understanding the order in which operations are carried out is of paramount importance in programming. Think about the following expression:

```
3 + 7 * 2
```

Depending upon how we interpret the equation, the answer could be 17 or 20. If we add three and seven first, we end up with 10 * 2, or 20. Likewise, if we multiply seven and two first, we get 3 + 14, or 17. The notion of which operations to perform first is called precedence. Operations with a higher precedence are executed first, and next the operations with the next-highest precedence. In situations where two operators have an equal precedence, statements are evaluated from left to right.

The table 'Operator Precedence' shows JavaScript's operators and their relative precedence. It is important to understand how precedence relates to all of the operators. Consider the following example:

```
BooleanA || BooleanB && BooleanC
```

Is the conditional True if BooleanA, or both BooleanB and BooleanC, are true? Or is it True if either BooleanA or BooleanB, and BooleanC are True? This leads to the discussion of parentheses (). Parentheses have a higher precedence than any other operator and are used to group operators and operands to be evaluated first. Looking back to our first example, if we intended the expression to evaluate to 20, we would have to write (3 + 7) * 2 which would produce the correct answer (multiplication has a higher precedence than addition). Parenthesis can also be used to clarify statements that otherwise might be confusing. The previous conditional could be expressed BooleanA || (BooleanB && BooleanC). Although the meaning of the statement hasn't changed, it is easier to understand what the intended operation is.

We've covered a lot of material this lesson, but you haven't finished yet! On this month's **apcmag.cd** and *apcmag.com* you'll find code examples, complete with explanations, on all the concepts presented in this section so far. Make sure you have a look! Next month we'll be taking a more in-depth look at conditional branching and looping statements.

Operator precedence

(from highest to lowest)	
Parentheses	()
Multiply, divide, modulus	*, /, %
Addition, subtraction	+, -
Relational	<,>, <=, >=
Equality	==, !=
Logical and	&&
Logical or	||

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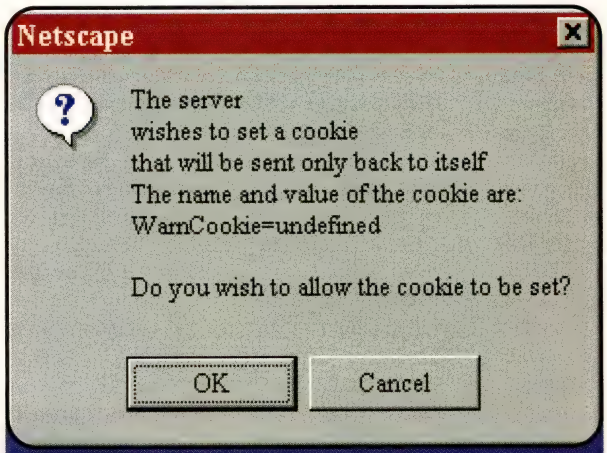
C stands for many things, but to the HyperText programmer, C is for cookie — and that's good enough for me. **By Lee Borkman**

HyperText

You might have heard of them. The most insidious assault on your privacy since the Australia Card? Virus carriers? Does that jog your memory? Actually, the humble cookie is really pretty cool, and a mighty useful addition to the Webmaster's bag of tricks.

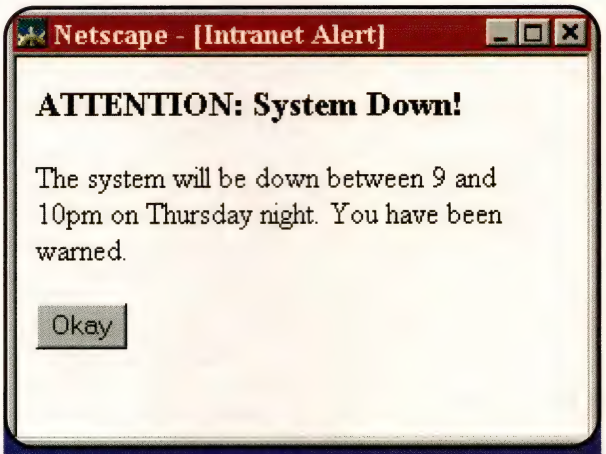
So what is a cookie? It's a strange name, and I have no idea where it came from, but the concept is simple enough. A cookie is just a piece of information left by a Web server on the client's system, information that the server can access during your future visits to that particular site. And why would a server want to do that?

Well, it's a common complaint, and one of its great shortcomings, that the World Wide Web is a 'stateless' system. You might remember all of that talk about 'state machines' in early computing texts and lectures. A vending machine sits around waiting for some coins. Call this 'State A'. When the machine is in State A, it will callously ignore you as you push on the buttons that select your favourite chocolate-covered muesli bar. It will, however, accept more coins. But when enough coins are dropped in, the machine switches to State B. In State B, the now-generous machine refuses to accept any money, but will gladly respond to a request for food. After it feeds you, the machine returns to State A.



If you wish, Netscape will ask you before it leaves a cookie.

A vending machine is a simple example of the state machine. This is an absolutely fundamental concept in computing science, and in all of engineering, for that matter. It's an idea captured in the data-flow diagrams and other flowcharts so loved by software engineers.



Our example cookie script in action.

The World Wide Web, unfortunately, is not a very good state machine. This didn't matter terribly much when your average Web site consisted of static text with no substantial interaction, but times have changed. We now have all manner of active content and interactivity, so you can tell a site about yourself, and it can actually shape itself to suit your needs. In other words, the site can respond to your input by entering a new state. The trouble occurs when you return to the site at some later date. You find that the site has returned to its default state, and you have to tell it about yourself all over again, even if you were only there five minutes earlier. This happens because the Web is largely anonymous. Although a server can usually find out (through the common gateway interface) some kind of information about your machine's ID and your service provider's domain name, there is no consistent, reliable method of automatically accessing user information. That *would* be a justifiable concern for all of those privacy buffs out there.

The advent of the cookie provides a way to get around the Web's forgetfulness. Netscape Web browsers allow any server to write some data to a simple text file (called COOKIES.TXT on PCs). A common strategy is for the server to simply assign you a unique ID number, and store that in your cookie file. At the other end, the server can maintain its own database containing information about its visitors. If you fill in a form, those details can be stored, or the database could remember which pages on the site you have accessed, and how often. In short, the database can contain any personal information you want to divulge, as well as detailed information about how you have previously used the site.

When you visit a particular site, the server looks for its own entry in your cookies file. If it can't find one, then it assumes you are a new visitor, assigns you a new ID, and creates a new cookie entry. If it does find its own cookie, then it can read the ID and look up the appropriate information in its server-side database. The site can then return itself to the same state as when you last visited. It's very handy.

Is this really such a worry for security and for privacy? Probably not. Although the server is being allowed to write to your file system (usually a security nightmare), the browser only permits extremely limited access. Changes can only be made to one text file, and the kinds of changes are also strictly controlled. A server cannot read or remove cookies left by other servers, so

Microsoft's server can't find out whether you've ever visited Netscape's site (just an example). Furthermore, an IBM site can't neutralise Microsoft's database by erasing all of the Microsoft cookies. As for privacy, the server doesn't know anything about you, except that you are the same person who visited last Thursday. There is no way to use cookies to access personal information, unless you explicitly tell a site all about yourself. Cookies merely allow sites to remember what they have found out, and most of the time that will benefit both client and server. You can even set an option in Netscape that will ask before it allows a server to create a cookie.

Well, that's enough preamble. You can use cookies in your own site, even if you don't want to dive into database connectivity and other tortuous fields. This is especially useful for intranets, where there is control over which browsers are being used. As I have hinted, Microsoft's Internet Explorer does not support cookies, but if you are running your company's intranet, and if everyone is using Netscape, then you might like to try a simple example.

Perhaps I'm the Webmaster for a large corporate intranet, with over 1,000 users. I want to create a method for broadcasting important Web-related messages to the intranet users, but I know people get annoyed if they are forced to read the same message again and again. Ideally, I would like a special broadcast message window to be prominently displayed on each workstation once, and once only. I'll use a cookie.

```
<SCRIPT LANGUAGE=JavaScript>
function DisplayMessage() {
        warning = window.open("", "WarningWin-
dow","height=200,width=300,scrollbars=yes");
        warning.document.write("<TITLE>Intranet
Alert</TITLE><BODY BGCOLOR='ffffff'>");
        warning.document.write("<H3><B>ATTEN-
TION: System Down!</B></H3>");
        warning.document.write("The system will be
down between 9 and 10pm on Thursday night.");
        warning.document.write("You have been
warned.");
        warning.document.write("<FORM><INPUT
TYPE='BUTTON'");
        warning.document.write("VALUE='Okay'
onClick=self.close()></FORM></BODY>");
        warning.document.close();
}
function CheckAndDisplay() {
        if(GetCookie("WarnCookie") == null)  {
                DisplayMessage();
                var expdate = new Date();
                expdate.setTime(expdate.getTime()
+ (24*60*60*1000*3650));
                SetCookie("WarnCookie, "...", exp-
date");
        }
}
CheckAndDisplay();
</SCRIPT>
```

We need to use a little JavaScript to access the cookies file, but this isn't a JavaScript workshop, and I'll try not to get bogged down in the detail. There are some handy public-domain cookie functions available at http://webreference.com /javascript/ (many thanks to Bill Dortch and Nick Heinle). These functions include SetCookie() and GetCookie().

SetCookie is usually called with two or three arguments (download the source and check out the details). If you set a cookie with only two arguments (name and value), then the cookie will disappear when the user quits the browser. If the third argument, an expiry date, is given, then the cookie is written to the cookies file, and will remain there until its expiry date has come around. This is how you can make your cookies volatile or persistent (I'm sure you can think of uses for volatile cookies).

GetCookie(name) returns NULL if the server has never set a cookie with that name, and returns the value of the cookie if one exists. For our example, we will simply check to see if the cookie exists.

Our script, to be added to our intranet's home page, is simple:

1) Check the cookie to see if the message has been seen before. If it has, go to 4);
2) The message has not been seen before, so display message in a new window;
3) Set a cookie to show that the message has been seen;
4) Clean up and exit.

Assuming we have included the public-domain functions (not shown) at the beginning of the script, here is the code:

This code uses JavaScript to check and set cookies, and to create a new window, which gets filled with simple HTML. It's a simple piece of programming, and probably not that useful in this unpolished form, but any number of enhancements could be added (with no great effort) to turn this into a very handy addition to any intranet. Here are a some suggestions:

1) Create an array of messages, so that more than one message window can be created;

2) Add date ranges for each message, so you can control when they are displayed;

3) Replace the Okay button with two new buttons: 'Remind me again later' and 'Don't show me this message again'. (This enhancement is quite challenging, but very useful); and

4) Create a form, and a CGI form-handler, to automate the task of adding new messages to the list (stretch those Perl muscles).

So there we have a quick peek at cookies. The cute name disguises an idea that could have a profound impact on the shape of the Web. By giving the World Wide Web a memory, cookies can turn that gigantic, stateless simpleton into a responsive, rather intelligent environment. The repetitive frustrations and utter tedium of Web surfing may soon be behind us.

Is there any chance that Microsoft and Netscape could come to some agreement on standards for cookie-ing, so we can all begin to benefit? Well, I really don't know, and that may just be too much to hope for.

In the meantime, you can prepare yourself for the coming cookie onslaught. Keep reading our JavaScript Workshop, dive into some huge book on database connectivity, and you are well on your way. Don't be afraid. Don't be shy. Don't turn off the cookie option in your browser! Cookies are not the end of the world. Cookies offer you the chance to build up ongoing *relationships* with your visitors. Use this power well, and you might just make your own little corner of the Web an even happier place.■

During the lengthy wait for Windows 97, many programmers produced upgrades for various Windows 95/NT components. This month we cover a range of programs designed to improve upon common Windows applications. **By David Nourse**

Windows Shareware

HyperTerminal Private Edition 3.0

HTPE is a free upgrade for the Windows 95/NT HyperTerminal communications applet. In contrast to the rather pathetic Terminal applet which came with the 16-bit versions of Windows, HyperTerminal is a capable communications application, supporting most of the useful file transfer protocols and terminal emulations. This upgrade fixes minor bugs and provides a couple of useful enhancements.

The major improvements are an automatic redial facility, support for typing foreign characters, and the inclusion of the Zmodem protocol with crash recovery. The automatic redial facility isn't a tremendous advantage under Telstra regulations — you'll need to go to the Windows Registry to change the two-second default redial delay. While the documentation includes instructions for this hack, I'd prefer to see it implemented as a program command.

Zmodem crash recovery, however, is a wondrous thing. The ability to resume an interrupted file transfer will appeal immensely to anybody who's been in the middle of a lengthy download and run out of time or had some helpful family member pick up the phone.

Another useful addition is HTPE's capacity to serve as a Telnet client through support for TCP/IP. It's a simple matter to set up a connection to a Telnet host via a dialog on the Properties sheet. You can also set HTPE as the default Telnet client for your Web browser.

As the Internet juggernaut goes on its merry way, consigning most bulletin-board services to the same fate as the dodo, the average user is going to have little need for a high-powered communications program. Unless you have specialised requirements, HTPE should provide good service at an unbeatable price.

Publisher	Hilgraeve
Price	Free for personal use
Online	http://www.hilgraeve.com

CWordPad 1.2

CWordPad is aimed at people who are content to use WordPad as a simple word processor, but miss the convenience of an integrated spell checker. Unless your typing is absolutely flawless, a spell checker is a must, even if you've never hesitated over the number of paired letters in 'embarrassed'.

CWP's spell checker compares favourably with those of the big guns of the word processing world. There's a good range of options for ignoring words that are normally, and annoyingly, queried: words that are in upper case, contain a mixture of cases, or include numbers. This is handy for common items like names, email addresses and Web locations.

For the orthographically challenged, the spell checker can suggest corrections based on typographical or phonetic similarity. If you're just a lousy typist like most of us, there's an auto-correct dictionary for the most common typos.

It's a simple matter to edit CWP's dictionaries (plain text files) to add words or to include your most frequent typos. You can also take advantage of the auto-correct feature to create short text macros, for example, to expand initials into names. Other dictionary management facilities include dictionary import, export and creation. New dictionaries can be created for a large number of languages.

The only other major improvement to the original WordPad is CWP's help files, which are nicely done. A clickable diagram of the CWP display provides a quick way to check out the program's tools, and more detailed help is available on all menu items. I was a bit disappointed to find that CWP retains WordPad's most annoying limitation — you're still confined to working on one document at a time. A multiple document interface would be most welcome.

Today's commercial word processors positively groan under the weight of their own features. If you have no great urge to create tables of contents, outlines or indexes, and could do without yet another 'helpful' wizard or similar virtual assistant, CWP may be a better and much cheaper way.

Publisher	Cetus Software
Price	Freeware
Online	http://www.cetussoft.com

XCalc 2.03

XCalc is a nicely implemented calculator application available in both 16-bit and 32-bit versions. It's designed mainly to meet the needs of programmers, scientists

Publisher	Bernt Ribbum
Price	Freeware (author would appreciate an email)
Online	http://www.hkcc.pccu.edu.tw/document/linux.manual.Unifix/xcalc.html

and engineers, and utilises Reverse Polish Notation (RPN), which will be familiar to users of high-powered handheld calculators.

Like the Windows calculator applet, XCalc can handle several number systems (decimal, hexadecimal, octal and binary), making it a useful programmer's utility. The non-decimal modes use 32-bit signed integers and provide a useful range of operators, including AND, OR, XOR, NOT and left/right shift, arithmetic shift and rotate.

For those aforementioned scientists and engineers, decimal numbers are available in both real and complex forms. Internal representation is 64-bit, which amounts to about 19-digit accuracy. In scientific mode, a number's mantissa is displayed in 15 digits. If you like your numbers expressed a bit more concisely, a fixed-point display is available (0 to 9 decimal places). Allowable floating-point values range from 1e-999 to 9.49999 e+999. Decimal numbers can be displayed in fixed-point, scientific or engineering formats.

XCalc has a fair range of scientific functions — square and cube roots, square, cube, logarithms (natural and base 10), trigonometric functions and their inverses, power functions, factorial and absolute value, Cartesian and polar coordinate conversions, and degree/radian and time modes. It doesn't have statistical functions, but does have a useful set of common conversions for temperature, mass, distance, area and volume. The conversions include both metric and imperial measurements.

Most of XCalc's functions are accessible from the keyboard. Its user interface can be customised to a considerable extent. You can make the number display more readable using the font and size of your choice, pick your own colour scheme and, less usefully, suppress several parts of the display.

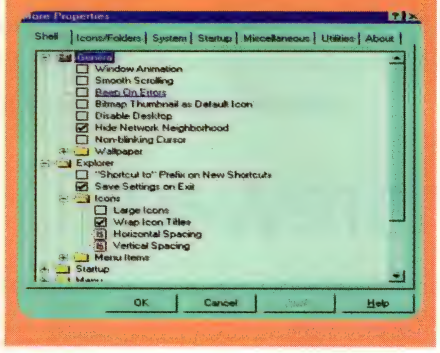
If you're looking for a high-precision calculator and are comfortable with RPN, XCalc should prove a useful replacement for the Windows Calculator.

More Properties 2.01

More Properties is a neat utility for Windows 95/NT which enables you to customise many features of the Windows GUI without venturing into the hazardous world of Registry tweaking and hacking. It is similar in purpose to Microsoft's useful TweakUI in the Power Toy set, but offers a lot more options.

MP's functions are accessed from a set

Publisher	Imaginary Software
Price	Freeware
Online	http://home.global.co .za/~olivierd/imaginary/



of tabbed panels. The Shell, Startup, System, and Miscellaneous panels use an Explorer-style tree of folders which expand into clickable controls for the various tweaks and massages. The Icons/Folders panel displays your current system icons (My Computer, Recycle Bin and so on) and provides a quick way to change them.

The Utilities panel provides shortcuts to the Registry Editor, System Configuration Editor, TCP/IP Configuration and Control Panel, together with an assorted bunch of tools to clear the Document menu or add files to it, rebuild icons, and make 16-bit Windows applications more compatible with Windows 95. You can also add shortcuts to any other useful tools.

The Shell panel has the largest collection of hacks, covering aspects of Windows GUI operation and startup, numerous niceties of Explorer's behaviour, extended settings for double-clicking, mouse dragging and the Autorun function, and setting Windows Help colours.

The Startup panel provides a simple way to customise your system's behaviour on booting up, alter some characteristics of the Start menu and change settings for the Windows Safe mode. Useful Miscellaneous settings include alterations to the Control Panel's Add/Remove Software facility, and an extensive Options collection to customise More Properties itself.

Some of these hacks are a bit esoteric, and I was pleased to find that More Properties has a comprehensive Help facility to clarify the murky details. If there's anything you'd like to change in your Windows 95 environment, it's worth seeing if More Properties will do the trick.

NotesPad 7.6

If the number of replacements that have been written is any indicator, the NotePad applet heads the Windows hate list. NotesPad is a strong contender for the best Windows 95/NT replacement: it addresses Notepad's biggest deficiency in its capacity to handle up to 16 large files simultaneously, and has many additional features that make it well worth a try.

NotesPad's user interface has some novel touches. A toolbar button provides a quick way to adjust the font size; you can expand the font by clicking on the top half and shrink it by clicking on the bottom. In addition to the usual file-history list attached to the File menu, another toolbar button accesses a list of up to 26 of your favourite files. There's an optional secondary toolbar which includes the usual copy, cut and paste tools but also allows you to sort the current file, shell out to DOS, or start up your screen saver.

You can also define a Properties sheet for each file. In addition to saving your font display and word-wrap preferences, the sheet allows several useful printing options, including margin setting, titling and page numbering.

Multiple document handling is nicely implemented, using the visual metaphor of a tabbed notebook to switch between open files. NotesPad's version displays filenames on the tabs, and it's very easy to move chunks of text around.

There's an increasing tendency for text editors to include features which would normally be found only in word processors. NotesPad has a spell checker with dictionaries available for American and British English and five other languages, as well as specialist legal and medical dictionaries. There's also an auto-correct dictionary for common typos and the usual personal dictionary; both can be edited via the program's Options submenu.

NotesPad also includes a very useful 'glossary' function for handling text macros. You can define an entire slab of formatted text as a macro, using a key as short as a single character. Macro creation is extremely simple. A particularly nice option is to select a passage of text, hit Shift-F2 and enter your key.

Anybody who does much work with text files should find NotesPad a great improvement on Microsoft's underpowered applet.

Publisher	Bremer Corporation
Price	Freeware
Online	http:\\www.BremerCorp.com

We take a look at some old, some new and some downright handy shareware programs currently available.

By Ashton Mills

OS/2 Shareware

Config Sort 2.00

Config Sort is a clever little utility. One of the most well-known user-unfriendly aspects of Warp is the ever-important CONFIG.SYS. Experienced users know their way around it most of the time, but those who are less familiar with this arcane file are likely to leave it alone, forgoing any performance benefits obtained from a properly tailored CONFIG.SYS.

That said, Config Sort performs as its name suggests — it sorts the CONFIG.SYS into easily defined sections of BASEDEVs, DEVICE drivers, SET statements, network drivers and IFS lines. An added benefit of sorting the CONFIG.SYS is a noticeable reduction in system boot time, depending on how your system is configured. Although Warp reads in the entire CONFIG.SYS before processing it, it does process it sequentially, following a set of rules (IFS lines and BASEDEVs first, for example). The speed benefit comes when Warp has to load all of your drivers and system files; if they are listed sequentially, it can lead to faster load times, since most drivers are located in a similar location on the disk.

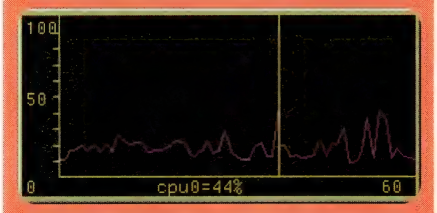
Config Sort even makes a backup in case you change your mind about your newly sorted CONFIG.SYS. Try it out.

Publisher	Thomas Paatsch
Price	Freeware
Online	http://hobbes.nmsu.edu/

CPUMon 1.1

There are plenty of CPU, memory and performance monitors out there, but this one is different. CPUMon will only run on Warp 4, Warp Server Advanced or Warp 3 with FixPack 29 and later. This is because it utilises a new API call introduced into these versions of OS/2 — an API call that allows you to monitor processor usage *without* starting up a thread to actually monitor the CPU, which by its very nature will soak up CPU resources. Using CPUMon to measure

Publisher	Trevor Hemsley
Price	Freeware
Online	http://hobbes.nmsu.edu/



your processor usage will produce a much more accurate result than those monitors that spawn threads to monitor CPU levels, such as PMPatrol.

CPUMon is small and easy to configure, with just a few options such as colours and update frequency. It even monitors up to 16 CPUs in an SMP system, so you can watch how each of your CPUs is being drastically underused. If you're looking for a small CPU monitor that reflects real performance, check it out.

InJoy 1.1

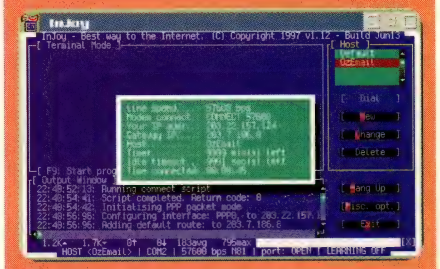
Now this is a dialler with style. Who needs another dialler? What's wrong with the IBM dialler that comes with Warp? Quite a lot, actually. Unlike the IBM Dialler, InJoy was designed from the ground up to be easy to use, feature-filled and *very* fast. In terms of connection times and script processing and actual transfer speeds, InJoy is one fast product — due entirely to the fact that it uses its own implementation of PPP and SLIP, without calling on Warp's built-in TCP/IP protocols.

In essence, F/X Communications took advantage of how PPP and SLIP works to increase the amount of data transmitted with each packet. Default PPP settings under Warp and Windows 95 lead to moderate and expected transfer times. Using InJoy's 'fast' option (as opposed to the more secure 'slow' option) various features such as the MRU size, timeout values, thread priority and special settings such as FCS checking, PAP Authentication and protocol compression are all set for you to provide optimum transfer speeds — and they work. After using InJoy you won't want to go back to Warp's PPP, which simply doesn't cut it.

InJoy isn't just a dialler; it also includes a collection of features that make it a doddle to set up and use. All you need to know are the number and name server addresses of your ISP and you can set up an entry in no time at all. You can easily configure which programs to autostart (such as Netscape), what details to display and log, retry dials and alternate numbers. You can even specify if you want to connect to InJoy's ticker server — a free ticker service that displays (with a minimum of bandwidth — all tickers are text) latest OS/2 and Windows news, shareware, products, job advertisements and so on. And the built-in scripting engine will 'learn' from you the first time you log onto your ISP and save the results to be automatically used next time you log on.

If this isn't enough, you can also configure InJoy to be an Internet gateway for OS/2 clients as well as Mac and Windows clients.

Publisher	F/X Communications
Price	$US20 for basic client; extended and enterprise clients available
Online	http://www.fx.dk/injoy/



LXLite 1.1.5

Anyone remember those DOS programs of old that used to save (what was back then) large amounts of space by compressing executable files, and decompressing them on the fly when executed? I hope you do, because such programs were the key to saving large amounts of space easily and efficiently, without the need to delete files. A smart implementation of a simple concept, real-time file decompression saves space on your drive.

LXLite is exactly this, only it's for OS/2. It will compress executables by an average of 50%, which, across a whole drive of applications, is a lot of space. What's more, you don't notice that your files have been compressed, because decompression is instant.

LXLite comes loaded with features and a presentable text-mode interface. You can compress files with a variety of compression methods and select a range of files specified by wildcards and subdirectories.

LXLite is freeware, which is quite remarkable for such a well-presented, efficient and useful program.

- **Publisher** Andrew Zabolotny
- **Price** Freeware
- **Online** http://hobbes.nmsu.edu/

Chkdsk32

Your eyes are not deceiving you. Chkdsk32 is a 32-bit version of OS/2's CHKDSK.EXE, a fix-disk utility which is older than the Pantheon, as arcane as the wizard Merlin, and about as user-friendly as the Windows Help system.

You're probably assuming that some third party has taken over the reins and produced this CHKDSK update, but no, IBM itself has finally realised that one of the most frequently called programs in OS/2 is in dire need of a revamp!

This specific revamp fixes a small number of bugs in CHKDSK — such as failing to detect certain disk errors it *should* have found and corrected in the first place — as well as fixing the extremely slow speed at which it used to accomplish its disk scans. According to the documentation, Chkdsk32 runs twice as fast as CHKDSK on single drives and up to 11 times as fast on RAID drives.

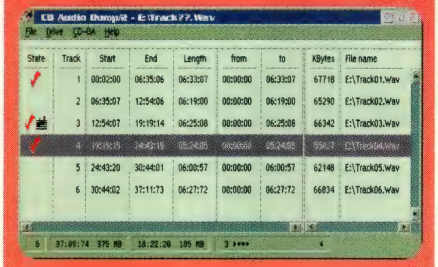
A nice little install utility will back up your old CHKDSK and replace it with the new Chkdsk32 beta release, to be called whenever CHKDSK is invoked.

- **Publisher** IBM
- **Price** Freeware
- **Online** http://hobbes.nmsu.edu/

CD Audio Dump 1.42

This shareware program can only be described as brilliant. It's well laid out, is very easy to use and loaded only with pertinent features. Its job is to dump audio files from your CD, and it performs it admirably. Why would you want to do that? Well, you may need to listen to CD tracks as WAV files on your drive, despite the vast amounts of space they take up (unless you intend to compress them into MP3s). Or perhaps you want to save certain samples, and do some sound editing and the like.

- **Publisher** Richard Reuters
- **Price** $US22
- **Online** http://ourworld.compuserve.com/homepages/Reuters



This is one of the very few CD audio dumping programs available for OS/2. It's nice to find that it's not just some command-line grabbing utility, but rather a professionally-designed PM application with all the bells and whistles. If sound is your thing, this program is the only CD dumping software you need.

4OS2 2.52

It's probably been said before, but 4OS2 is a utility you *need*. It's safe to say that most OS/2 users are fond of the command line — as with Unix, it's always a quicker way to perform certain file-related actions and, let's face it, Warp's Drive objects are far from being a handy file manager. There are many alternatives, such as the excellent (and previously mentioned) ZTreeBold, but sometimes nothing cuts it like the command-line environment.

The brilliant people at JPSoft released the first version of 4OS2 a long time ago, soon after its DOS-based counterpart. In fact, apart from the operating environment, the two shells perform the same functions and both can be used in OS/2 — use 4DOS to replace OS/2's COMMAND.COM in your DOS Windows and 4OS2 to replace CMD.EXE in your OS/2 windows.

So, on the off chance that you haven't heard of 4OS2, here's a brief summary of its features. First and foremost, 4OS2 is designed to help you work faster. Command-line completion (no need to type the whole line), alias associations (launch an application by typing the name of an associated data file) and quick directory changing (change to a directory on any drive without even issuing the CD command!) are just the tip of the iceberg. Add to this an extensive command history (shareable between all 4OS2 sessions) for both recent file commands and directory changes, accessible in a pop-up ASCII window, and the ability to colour and format your directory listings, and you have one very handy utility.

But 4OS2 extends much further than this. It comes with a complete subset of commands that you won't find in CMD.EXE, and its own scripting language, capable of performing mathematical functions and proper programming logic. In fact, 4DOS/4OS2 script is recognised as a separate programming language (though it's still an interpreted language). To fully make use of 4OS2, you have to read the very extensive documentation. This is the only place you'll find out about all the possibilities 4OS2 has to offer, and you can't take advantage of them unless you know about them. Check it out and register. It's one of those utilities you use and never look back.

- **Publisher** JPSoft
- **Price** $US69
- **Online** http://www.jpsoft.com

Useful shareware often comes in odd assortments, and this month's collection covers everything from screen savers to games. **By Ari Weisz-Koves**

Mac Shareware

ZipIt 1.3.5

Copying files to PCs can be frustrating for any Mac user. If one is using the Internet, the integrity of the file often depends on the applications being used on both systems, and sometimes even standard image formats don't make it intact as email attachments. A solution is to only transfer files in a stable archived form, and with the ZIP archiving standard used on most operating systems, it's an obvious choice for transferring files to DOS, Windows, OS/2 and Unix.

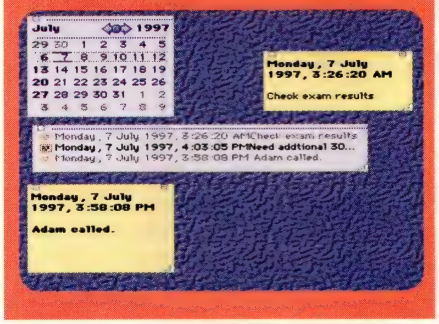
ZipIt is a small ZIP archiving utility for all Macintoshes. ZipIt allows file compression and extraction of any file using the ZIP format. In its registered form, it also supports encryption and decryption of these archives. The ZipIt interface is simple and familiar to users of StuffIt Deluxe, allowing similar drag-and-drop addition of files to archives from the Finder. Varying levels of compression are available, and the archives produced are fully compatible with the PKZip 2.0 standard. Also included is an AppleScript intended to provide instant decompression of any number of files dragged and dropped to it. ZipIt is an essential utility for anyone who requires even casual interaction with PC files.

Publisher	Tom Brown
Price	$US15
Online	http://www.awa.com/softlock/zipit/zipit.html

Gramotki 1.5e

Gramotki is a replacement for the Stickies DA provided with System 7.5.x, providing 'notes' to stick up all over the desktop. It includes a calendar function that combines with the notes in a useful way. When creating a note, the date and time can be included by default as the first two lines, perfect for making quick notes of tasks and jotting down phone calls. Unlike Stickies, however, not all the notes have to be open at the same time. Notes aren't lost, they are stored together in a file which can be searched or accessed by

Publisher	IDDI Information Systems
Price	$US15
Online	http://www.rocit.ru/mediateka/gramotki.html



the note level using the 'list of notes' window (Command+L). This provides the date and time, along with a shortened form of the message. The date and time are only stored as text in the message, so modifying the times within their format modifies the time that the message is stored at, and thus its order. This allows the list of notes to be used like a personal organiser, sorting tasks by the time intended.

Dates can be dragged off the calendar and into new notes, specifying when they should occur. Applications and documents can also be dragged off the desktop and into notes for instant access. Gramotki includes support for all fonts and several colours for highlighting. A strangely addictive little application, Gramotki can be used as an organiser for those not interested in a fully-featured system.

GoMac 1.2

GoMac is an interface addition for Mac OS that provides a program bar, start menu and program switcher just like Windows 95/NT. Though this may seem ridiculous to purists, GoMac can actually be used efficiently to provide instant recognition of active applications which are shown on the task bar, instead of moving the mouse up to the application menu. Command+Tab can be used to switch between applications, but this is something that can be achieved using countless other shareware INITs and CDEVs, including the Microsoft Office Manager control panel.

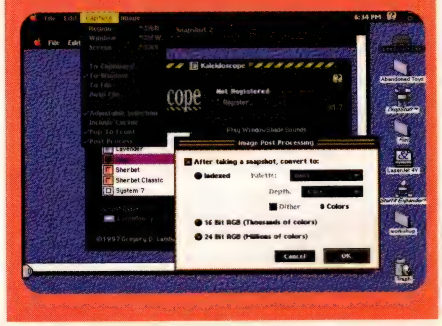
The start menu itself is useful, but only in its form as a rebadged Apple menu, offering recent documents, applications, servers, configuration options and control panels. On the good side, GoMac provides another place to gain access to files quickly at the bottom of the screen without having to move the cursor to the menu bar at the top of the screen. Essentially GoMac is a cute application, but it's not as functional as the menu bar, and just clutters up a small screen. However, GoMac could find a loving home with users of very large monitors, or just people who like the look.

Publisher	Proteron
Price	$US19.95
Online	http://www.proteron.com/ gomac

Screen Catcher 1.0

Screen Catcher 1.0 is a somewhat more advanced method of capturing screens and provides additional features to the regular Command+Shift+3 method of producing screenshots. It allows modification of the shortcuts used to initiate the screen capture, including capture screen, capture window and capture

Publisher	John Norstad
Price	Freeware
Online	http://charlotte.acns.nwu.edu/jln/progs.html



area when the Screen Capture extension is installed. Once an area is captured, the image file is available in the Screen Catcher application, on the clipboard, or directly saved to a file, depending on the configuration options selected. By default the image is opened in the application, where it can be converted and saved into one of three formats: PICT, JPEG and GIF, with the ability to convert between Mac, Windows and standard Web palettes.

Using the extension, the cursor and pull-down menus can be captured, and the preferences can be set to a specific post-processing to occur each time the snapshot is used. A nifty feature for HTML authors is the ability to automatically generate a tag for the image, including width and height information, to a base URL specified in the preferences. Screen Catcher is 1M in size — not too big, but not small enough to take place on every user's drive. At $US25 it doesn't represent incredible value. Screen Catcher is, however, exceptionally useful for anyone regularly needing to make captures.

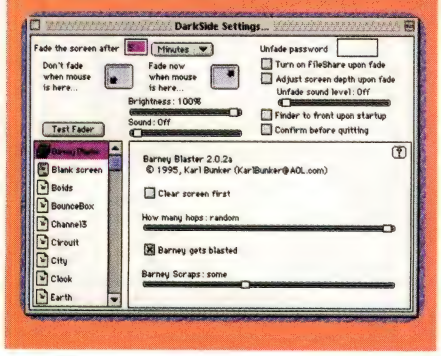
Publisher	St Clair Software
Price	$US25
Online	http://www.stclairsw.com/

DarkSide of the Macintosh 4.2

DarkSide is a freeware screen saver for the Macintosh. It is extensible, being able to read most After Dark modules, and includes 41 modules of its own. DarkSide is application-based, not an INIT or CDEV, so it doesn't conflict with the system. Instead, installation is just the addition of an alias to the start-up folder which automatically activates DarkSide each time the machine is booted.

Like all screen savers, the time required for DarkSide to become active can be modified with ease. All the configurations are available in one window, including the options for the individual modules, allowing a degree of personalisation to most modules. Every module can be easily tested and brightness and sound can be controlled using a slide bar. DarkSide can be set to require a password before returning the system to regular use — handy when you don't want prying eyes to see what lies behind your favourite screensaver module.

Publisher	Tom Dowdy
Price	Freeware
Online	dowdy@apple.com



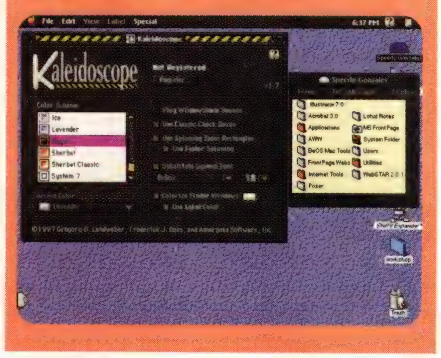
Kaleidoscope 1.7

Kaleidoscope is a control panel that provides easy manipulation of the Macintosh user interface through the modification of windows, colour schemes and system fonts.

Written by the authors of Aaron, the popular Copland-imitating extension, Kaleidoscope includes the Apple greyscale interface used by Aaron, as well as an assortment of other themes. These themes modify the appearance and colours of window frames, and can also control their behaviour with spinning zoom rectangles of variable speeds. Classic, rough-handwritten check boxes can be used along with any installed font in place of Chicago as the system font. Finder windows can be coloured any shade, or set to show the label shade for a background. Additional utilities can be used to specify image files for the window backgrounds.

Authoring themes is a simple process, and instructions are included. Kaleidoscope is definitely the coolest way to reface your Mac.

Publisher	Gregory Landweber
Price	$US20
Online	http://greg.math.harvard.edu



Speed Demon

Speed Demon is a car-racing game for Power Macs powered by a high-resolution 3D sprite engine. The polygon-based and texture-mapped 3D graphics are easily of commercial quality, and surpass those of any other shareware game seen before. The impressive video includes translucent fire, smoke, shadows, fog and a precise physics engine for realistic gameplay. The game uses a 640 by 480 resolution for the playing window and requires a powerful machine for peak performance. For full sound and video a 120MHz or above processor is recommended, but the 3D, 44kHz 16-bit audio can be set back to 8-bit, and the video can be set to run on 66MHz 601 processors without any problems. Control is by keyboard, mouse, or any of the supported joysticks.

Publisher	Cerberus Development
Price	$US20
Online	http://www.cerbdev.com/mac/speeddemon/index.htm

The shareware version includes only two tracks, one being a demolition-derby scenario. This includes machine guns and missile launchers to destroy the opposition, with mines and oil available to registered users. Speed Demon can be played over a network with up to five other players, but requires Open Transport 1.1 or greater. The updated versions of system files required to run Speed Demon are included, and 16M of free RAM are required.

Speed Demon is really a commercial-quality game, but as explained on the Cerberus home page, it's cheap to distribute over the Internet, with no packaging, media costs or sales tax, which makes its products excellent value for money.■

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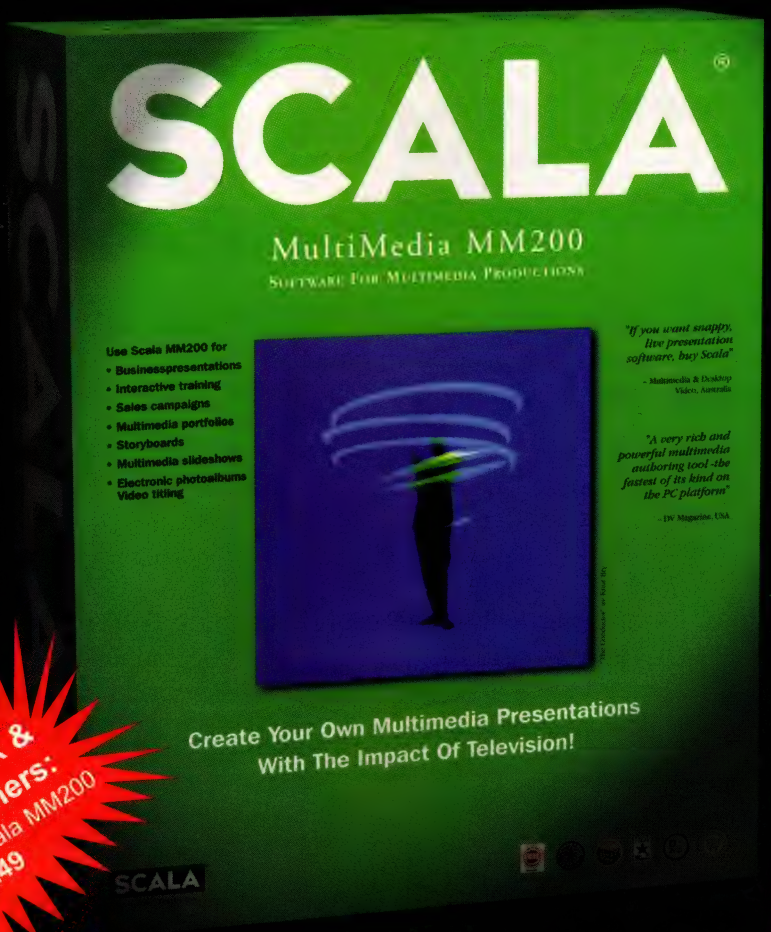

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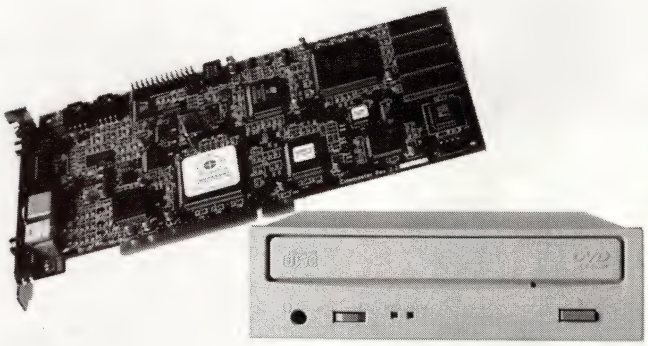

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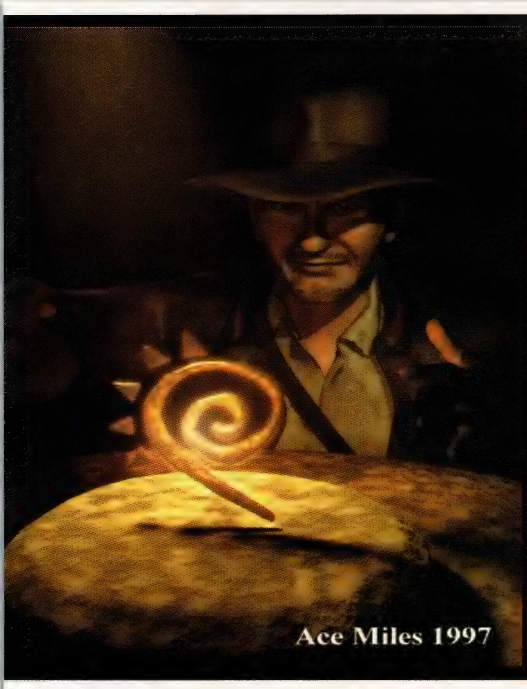

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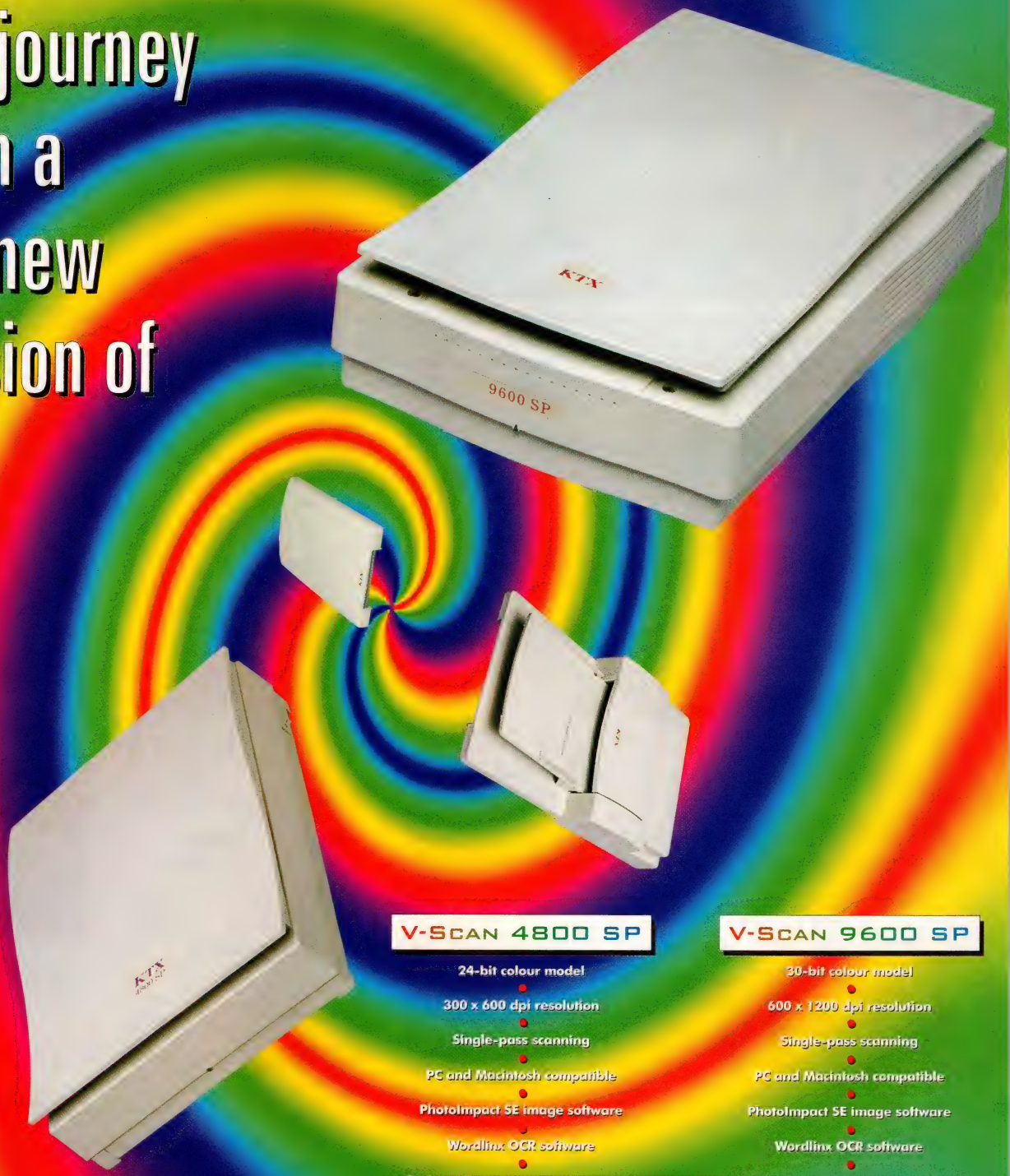

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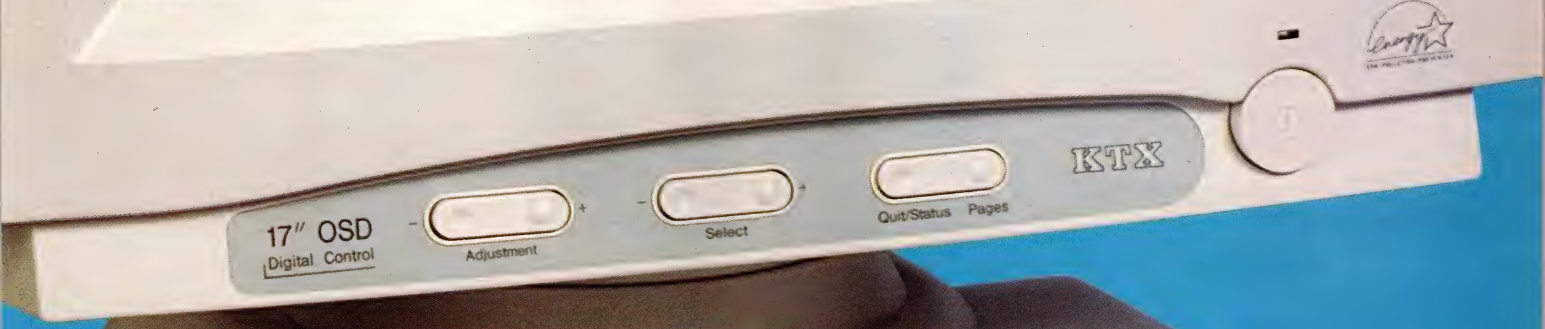

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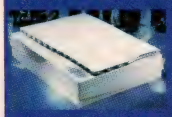

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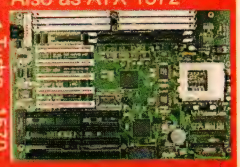

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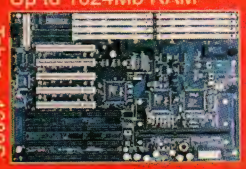

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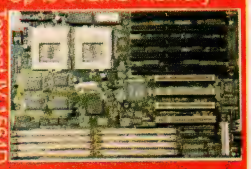

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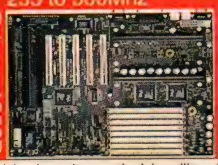

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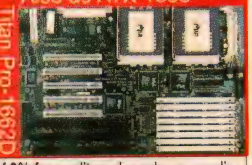

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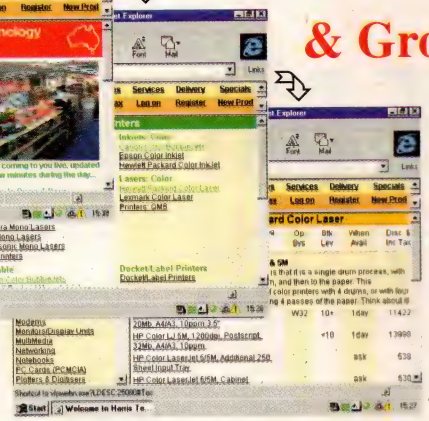

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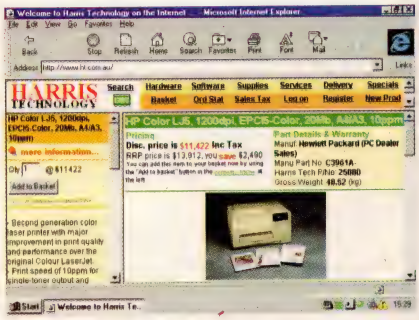

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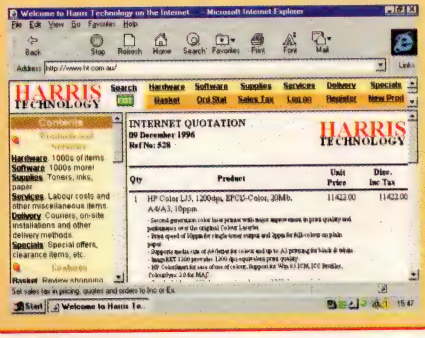

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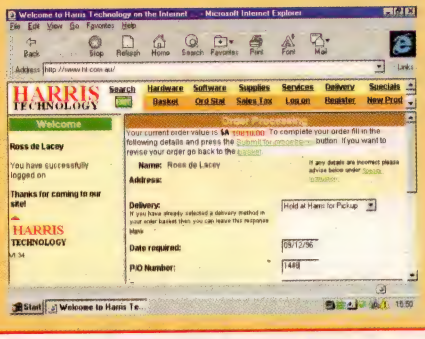

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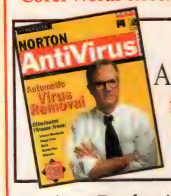

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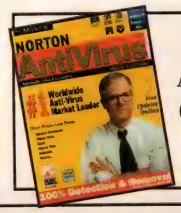

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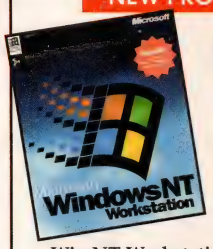

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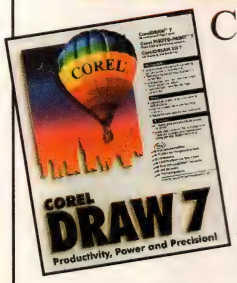

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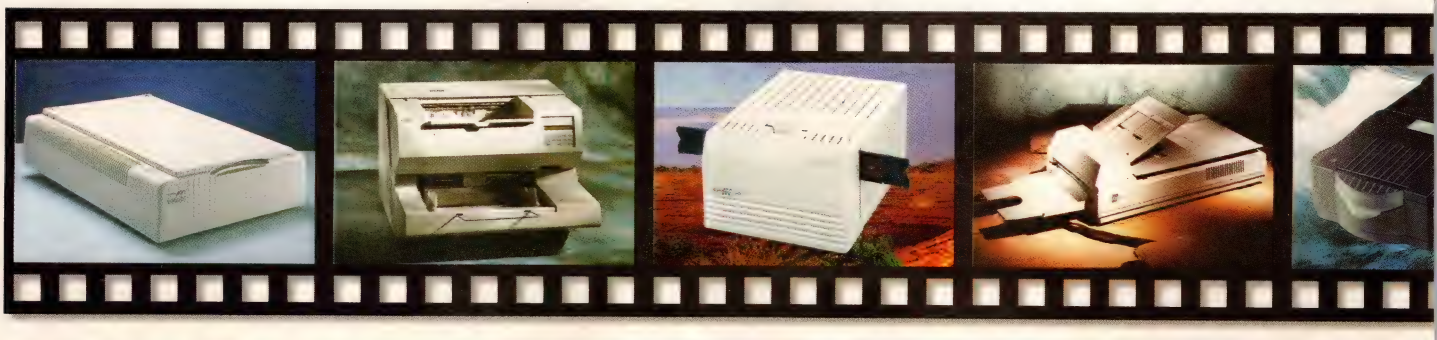

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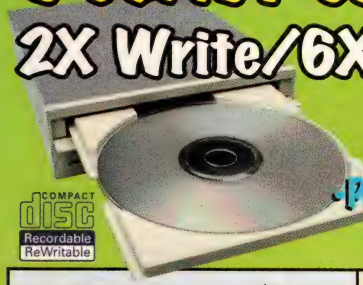

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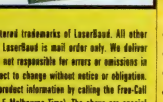

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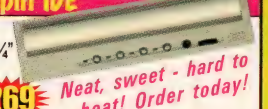

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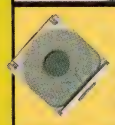

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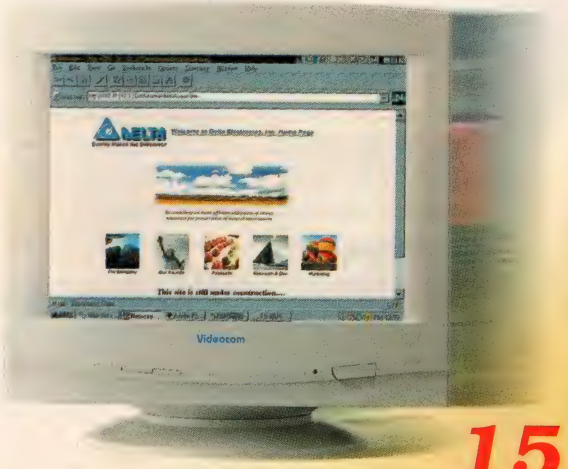

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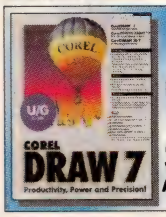

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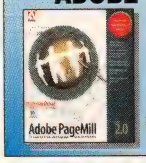

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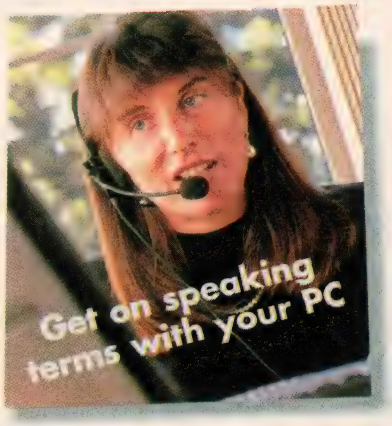

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System Requirements

Minimum 133MHz Pentium Processor IBM Compatible PC with 32MB RAM (Faster with MMX)

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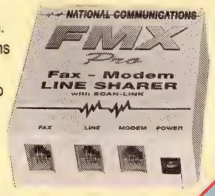

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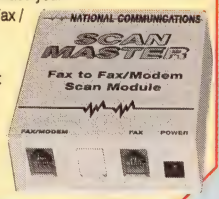
At last, you can now interface your Fax Machine with your Fax / Modem to provide Document Scanning to Your PC, Hardcopy Print to your Fax. Ideal for OCR applications. The only fully automatic device on the market.



AUTO 2 WAY TELEPHONE SWITCH

This low cost unit provides automatic connection to the telephone line on dialing. Other device is then locked out. Ideal for connection of Modems, Security Systems EFT-POS, Fax/Modems to a Fax Line, Commander, PABX or any type of Telephone Line.

AUTO SELECT

The Auto Select will allow up to eight Modems to be fitted to ONE LINE, or seven Modems and one Fax on the same line. Incoming calls can be automatically routed to any of the 8 separate devices. Barge-in protection is provided to ensure that only one device can have access to the line at any one time.

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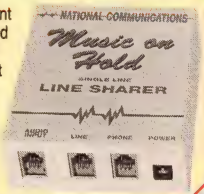

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Now you can answer a call on any telephone and then transfer the call to another telephone fitted to the same line, using your existing telephones. You can even use your phones as an intercom. No special wiring required.

HIGH QUALITY TELEPHONE INTERCOM NEW

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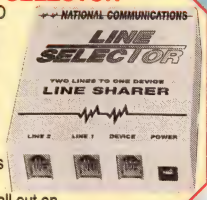
This compact low cost unit allows two telephone devices to ring each other and communicate without the need to connect to a Telecom line. Save 25c per call. Ideal for use in the Testing, Training & Demonstration of all telephone devices.

TWO LINE SELECTOR

Now you can connect TWO telephone lines (Telstra, Optus, PABX, ISDN or Tie Line) to one Fax, Modem, Cordless Telephone, Answering Machine or any Telephone device. Incoming calls will ring as normal on whichever line is free. You can even select which line you wish to call out on.



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The new RTA will allow you to call in on your telephone line and SWITCH ON and SWITCH OFF one or two separate electrical appliances simply by ringing your telephone line or using a touch tone telephone.

AUTO DIALER NEW

This new 'line powered unit', which does not connect to power, will dial any preset number or prefix as soon as you lift the telephone device connected to it. Ideal for use as a courtesy phone, automatic prefix dialer or any other application where the same number is repeatedly dialled.

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This new 'line powered unit', which does not connect to power, will dial any telephone number entered on your PC. Supplied complete with PC software and cable, this low cost unit is ideal for all telemarketing applications due to its compact size and ease of use.

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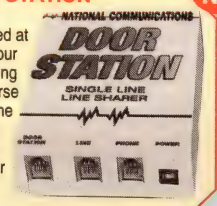

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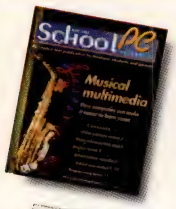

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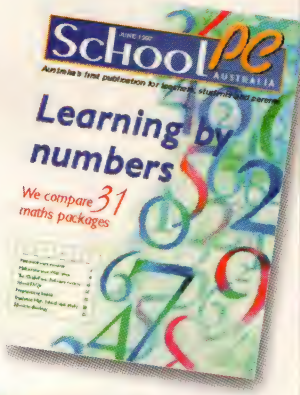

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1. Which of the following job titles most closely matches your position?

❑ 1. Managing Director, General Manager
❑ 2. Data Comms/Network Manager
❑ 3. LAN Manager
❑ 4. Microcomputer Manager
❑ 5. MIS Manager
❑ 6. EDP/DP Manager
❑ 7. Project Manager/Group Leader
❑ 8. Engineer/Architect
❑ 9. Accountant/Finance Officer
❑ 10. Systems/Programme Analyst
❑ 11. Consultant/Advisor
❑ 12. Other Computer Department Employee
❑ 13. Educator
❑ 14. Sales Representative
❑ 15. Office Administrator
❑ 16. Student
❑ 17. Other Professional
❑ 18. Other (please specify)

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2. What is your organisation's primary business activity?

❑ 1. Government, Utilities
❑ 2. Agriculture, Mining, Oil
❑ 3. Transportation
❑ 4. Construction
❑ 5. Computer Manufacturer/Distributor
❑ 6. Communications
❑ 7. Computer Retailer/Reseller/ Consultant
❑ 8. Finance, Banking, Insurance
❑ 9. Research & Development
❑ 10. Engineering, Architecture
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❑ 17. Other (please specify)

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3. How much IT equipment do you anticipate being involved with the purchase of during the next 12 months at work? (Please include all hardware, software, peripherals, connectivity equipment and consumables).

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❑ 2. $1 - $999
❑ 3. $1000 - $4999
❑ 4. $5000 - $9999
❑ 5. $10,000 - $49,999
❑ 6. $50,000 - $99,999
❑ 7. $100,000 - $249,999
❑ 8. $250,000 - $499,999
❑ 9. $500,000 - $999,999
❑ 10. $1,000,000+

4. How many microcomputers are you directly responsible for at work?

❑ 1. 1 - 9
❑ 2. 10 - 19
❑ 3. 20 - 49
❑ 4. 50 - 99
❑ 5. 100 - 499
❑ 6. 500 - 999
❑ 7. 1000 - 1999
❑ 8. 2000 - 4999
❑ 9. 5000+

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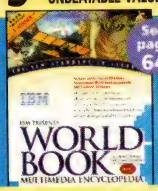

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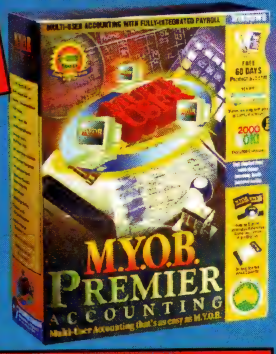

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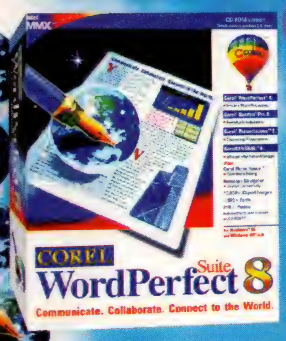

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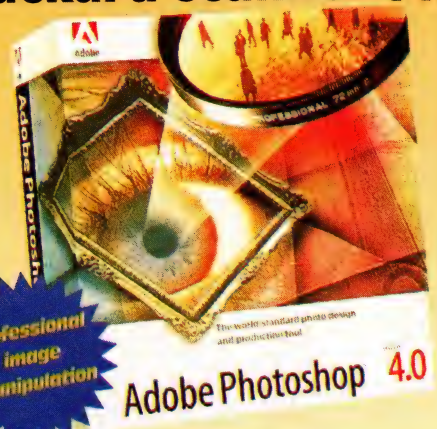

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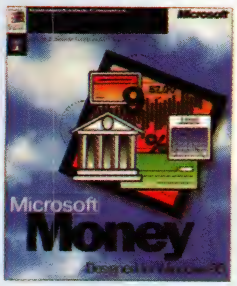

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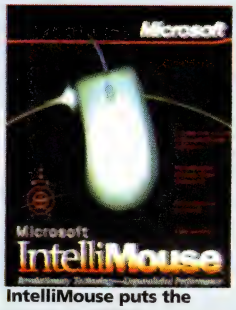

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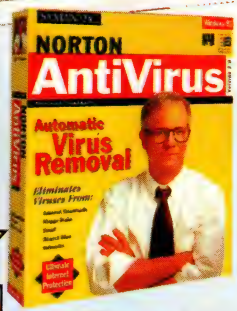

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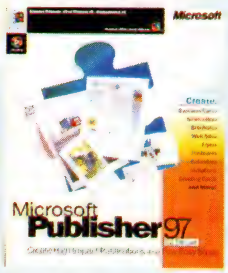

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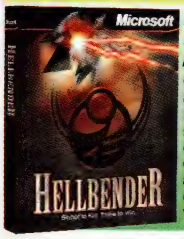

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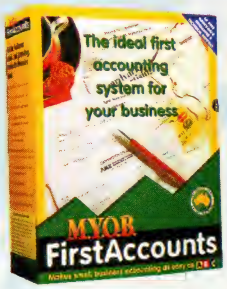

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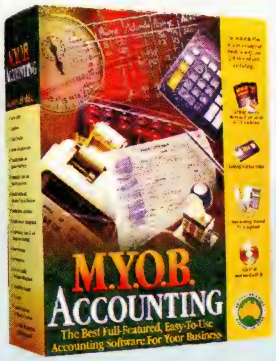

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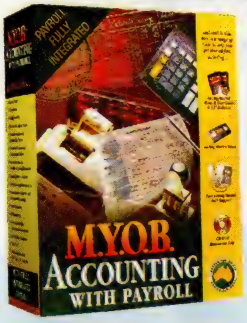

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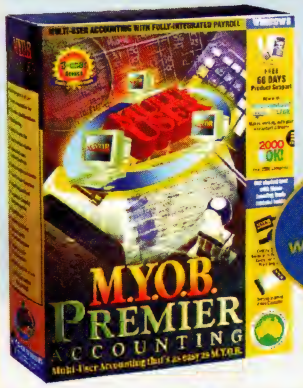

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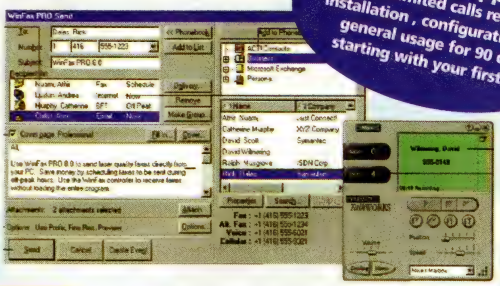

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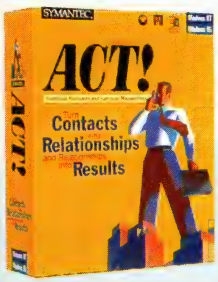

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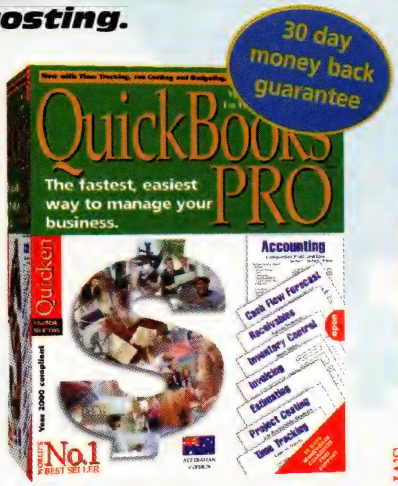

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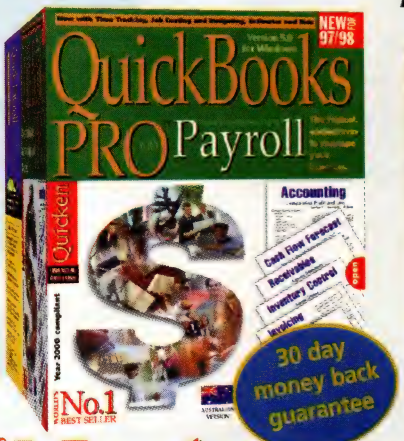

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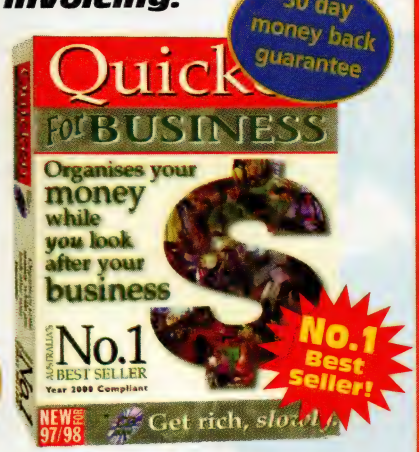

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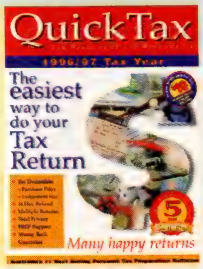

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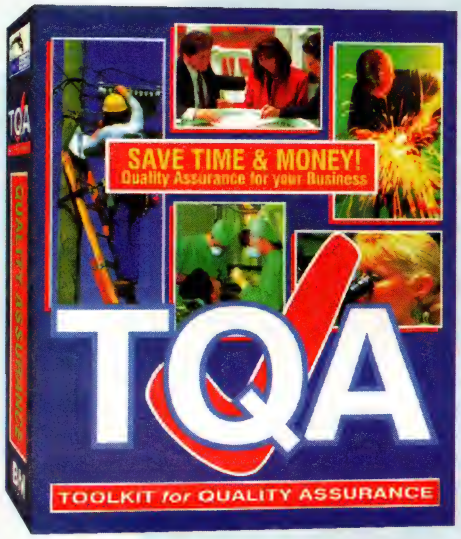
Qudos TQA provides you with templates to develop your system documents. These are designed to suit your choice of Windows word-processor (Microsoft Word 6.0, Word Perfect 6.0. Microsoft Works 3.0 and above). They include: - a complete sample quality manual, a selection of sample procedures, template forms, minutes, signs and labels, plus a complete system checklist. To make your job even easier - Tech Tips are provided on the use of all 3 Word Processors!

A comprehensive guidebook is included to assist you in customising the templates to suit your business. It covers all relevant clauses of the international quality standards - ISP 9001 / ISO 9002, the audit and certification process, plus case studies on various industries.

On-screen training presentations for management and staff are also included.

Q.A. is simply good business practice. Most companies and organisations will already have some elements in place Qudos - TQA allows you to incorporate existing documents into your Q.A. system. Many systems based on Qudos-TQA are in use throughout the world and have helped a wide spectrum of users to achieve lasting benefits, external certification, and industry awards.



FEATURES
- ✔ Low price - only a fraction of typical consultant fees!
- ✔ Covers all ISO 9001 / ISO 9002 standards
- ✔ No need to learn new software
- ✔ Flexibly integrate existing documents
- ✔ Work at your own pace
- ✔ Can be used in any industry or profession.

Designed for Microsoft Windows'95

AUSTRALIAN MADE

TQA001 TQA **$379**

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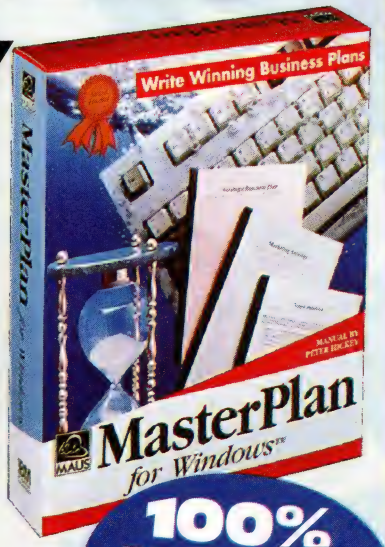
Business & Marketing Plans -The Easy Way

Save 50-90% of the time to prepare a plan!

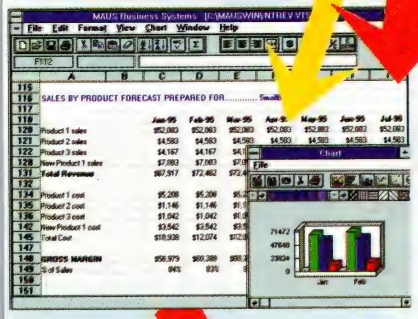
MasterPlan is designed for people who need a winning, professional Business Plan instantly. Its simple language reinforces its user-friendliness, explaining every process. A step-by-step question and answer format enables you to construct full financials, text and graphics at the click of a button. MasterPlan will also easily instruct you how to analyse and develop your business.

Topics covered include Sales Analysis, Market Analysis, SWOT Analysis, Marketing Plan, Financial Plan, and much more. Australian written and tested in the field, this program has been tailored specifically to meet the needs of Australian users and is suitable for both product and service businesses in any industry. With MasterPlan, your Business Plans will be more effective, more impressive, and greatly improve your chance of achieving success.



FREE Spreadsheet program and Word-processor!

100% Australian for Australian businesses



Market Analysis

MasterPlan will help you carry out a comprehensive SWOT analysis of your business. Its in-depth analysis of your company, products, competition and industry will enable you to capitalise on opportunities and prepare for potential threats in the marketplace.

Automatic Financials

Simply type your key expense and sales assumptions into the financial program and let the computer do the rest! Statements automatically calculated include Profit & Loss and Cash Flow statements, Sales Forecasts, Break-Even Analyses and Graphs. Just released, the new version even includes a Balance Sheet, Ratio Analysis, Actual v's Budgeted Comparisons and new user friendly Financial Wizards!.

Runs on Windows 3.1 & Windows 95

Key Uses

- Raise finance
- Increase profits
- Manage expansion
- Start a new business
- Impress your boss

Key Benefits

- Creates complete Business Plans
- Suitable for business people of all levels
- Creates full financials & graphs
- Includes a simple step-by-step tutorial

What the Press are Saying

"The brilliance of this system is that you're led through the entire process step by step... the results will be as good as anything a professional would have provided for you"
Your Computer Magazine

"(MasterPlan)... is a business tool par excellence, turning a grim chore into a fast, pleasant exercise... Extensive templates make the program a breeze to use"
Australian Small Business & Portfolio

Why choose MasterPlan?

- Finalist 1995 & 1996 - Channel 9 'Small Business Show' software awards contested by over 400 companies.
- 100% Australian with 1000's users across Australia.
- Used in TAFE & University courses Australia wide including MBA Programs.
- Recommended Resource - NSW Government's 'Export Access Program'.
- Used by Agribusiness students at Melbourne's Monash University to win an International Business Planning contest.

Product Summary

- MasterPlan - Level 1 (Standard) : Software to help you prepare a simple Business Plan only and a full set of accompanying financials. Suitable for loan applications.
- MasterPlan - Level 2 (Professional): Software to help you prepare either a simple Business Plan or a more detailed Business Plan which incorporates a full Marketing Plan and analysis. Includes full financial analysis, a follow up program which doubles as a Time Management tool and a FREE Business Planning workbook. Suitable for loan applications, analysing and improving an existing business, launching new products, or starting a new business.

AUS500 MasterPlan for Windows – Level 1 Standard **$119**

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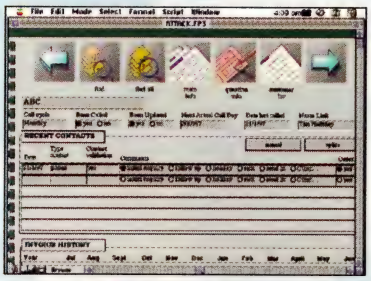
Claris FileMaker Pro

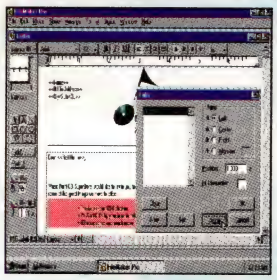
The easy to use relational database!

Filemaker Pro 3.0 is the only relational database application designed to help you easily manage and share information in the real world.

Starting with raw data, it's fast and easy, to create working databases on the Macintosh, Windows 95, Windows NT, or Windows 3.1.
In fact, Filemaker Pro comes with a complete set of professionally designed templates for instant business, education and home solutions. When you're ready to customise your database, FileMaker Pro has a set of powerful, yet extraordinarily easy-to-use tools that will take you well beyond where standardised wizards and other assistance technologies leave you. Create stunning input screens, reports, labels and mail merge letters in a flash. Automate frequently-used procedures and sequences - and much more. You don't have to become a database expert in order to take advantage of FileMaker Pro software's full potential! Nothing makes it easier to organise all your vital information and put it at your fingertips.

Users of FileMaker Pro 3.0 can now employ text rulers (inches, centimetres or pixels), tabs, indents and formatting within any text field in their database record or layout for better





Runs on Windows 3.1 Windows 95 Windows NT

CLARIS™

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Claris FileMaker Pro

- **Professional Templates** - Get started quickly with over 40 ready-to-run productivity solutions for business, education and home – including invoicing, mailing lists, contacts, tracking, home inventory, school records and more.
- **Relational Database Power** - Increase the power and flexibility of your databases by creating one-to-one, one-to-many, and many-to-many relationships between files. View and edit data from one file while working with another.
- **Data Handling & Variable Filed Length** - Add, change or remove fields, layouts or calculations at any time without rebuilding the database. Add notes and comments to any database record with up to 64,000 characters in any formatted fields.
- **Automate/Validate Data Entry** - Save time by inserting data automatically, such as date and text - even calculated values. Validate by requiring data of a certain type, unique, a member of value list or calculation.
- **Multiple Layouts & Graphical Report** - Design multiple layouts to view, enter and print your information by simply dragging and dropping fields from the current file or related files on a layout. Create reports and summaries to many levels of detail.
- **Network File Sharing** - Convert your database into a networked solution in one simple menu step. Share files easily within your Windows, Macintosh or mixed workgroups.
- **New Container type** - The Picture/Sound field type has been replaced by the Container Field type, which allows users to store a picture, sound, movie, or OLE object (Windows only).
- **On-line context-sensitive help and tutorial** - For the first time users of FileMaker Pro 3.0 can get an on-line interactive tour application to gain quick familiarity of the functionality of FileMaker Pro. Further they can also get fast answers to questions or problems wherever they are within the database context-sensitive help.

"We have listened closely to our customers in the Windows user community, especially those within large corporations, small business and even home settings in providing a version of FileMaker Pro that can be used within many Windows environments".
Patrick Maloney, Managing Director, Australia and New Zealand, Claris International

Claris Corporation is a leading worldwide vendor of Windows and Macintosh applications for business, education and home

STOCK CODE: CLA011

FileMaker Pro 3.0 ..... **$259**

CLA015 FileMaker Pro 3.0 U/G **$119**

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Claris Home Page 2.0

The essential Web page authoring tool!

Claris Home Page lets you design and develop powerful, customised Web pages in minutes - without having to learn HTML or programming. home page delivers the capabilities and tools you've been seeking - Frames, Tables, Libraries and more - in a cross platform solution that provides incredible ease of use, an intuitive WYSIWYG interface, Drag and Drop page development, as well as the flexibility and power experienced users want such as editing and manipulating HTML code. Claris Home Page is the best way to build dynamic Web pages for the Internet in just minutes.

Claris Home Page 2.0 Features

One-Button Site Publishing
Automatically consolidate all images needed in a site, then easily upload them to your web server.

Client-Side Image Maps
You can create and edit client-side image maps in addition to the existing support for server-side image maps.

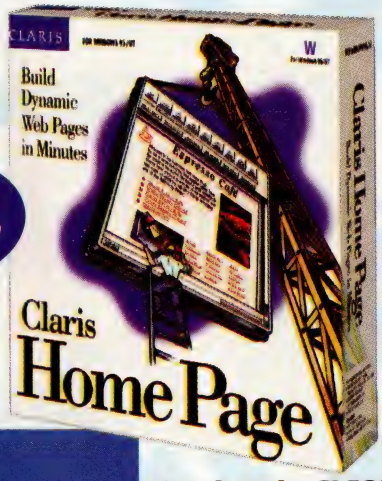
Variable Table Columns and Rows
Position the width of columns and the height of rows easily.

Extensive Multimedia Plug-In Support
You can include Apple QuickTime, Macromedia Shockwave and other popular plug-in files in your documents

Spell-Check Feature
This feature checks the entire document - all the text in the main body, in the table cells, form fields and titles. The spell-checker is HTML savvy in that it will not spell check the HTML tags.

Drag and Drop Tab Delimited Text
When you drag and drop tabular information created in other applications into Claris Home Page, it automatically generates a table for the information.

All your Netmail needs in one!



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Stock code: CLA022

$99

ClarisWorks Office 4.0 Internet Edition

ClarisWorks Office 4.0, the easy and reliable office productivity suite, featuring software solutions for accessing the Internet and includes all the office tools you have come to expect. ClarisWorks Office 4.0 Internet Edition empowers small businesses to manage everything from invoices and business letters to setting up a Web page without expensive technical consultants and without headaches.

Easy on ramp to the Internet:

For the many small business users who recognise the importance of Internet access but are put off by the technology, this special edition of ClarisWorks Office 4.0 provides a complete solution.

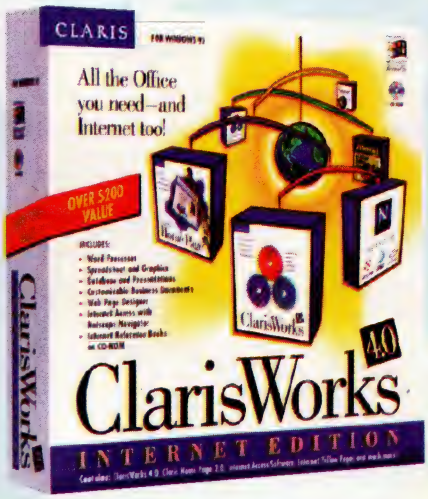
ClarisWorks Office 4.0 - Internet Edition software includes platform-specific solutions for easy Internet access. To get you accessing the Internet ClarisWorks comes with a selection of Internet connection software from leading Internet Service Providers, along with Netscape navigator for Windows 95 users. For finding information on the Web included is The ABC's of the Internet and the Internet Yellow Pages book on CD-ROM, and Claris Home Page 2.0, the next generation of the web authoring tool that lets users build dynamic web pages in minutes.

Rates by small business as more reliable, easier to learn and offering more value for money than Microsoft Office
DATAQUEST

For the Office:

ClarisWorks Office is a streamlined package which offers the right mix for the home & office & includes:
- Word processing • Database • Spreadsheets
- Drawing tools • Graphics features

ClarisWorks also features customisable documents designed for managing business, users can instantly create professional quality letters, reports, customer databases, manage mailings, budgets and presentations. Also included are more than 40 ready-made Claris Works documents for managing small businesses are also included.



CLA040 ClarisWorks Office Internet Edition **$169**

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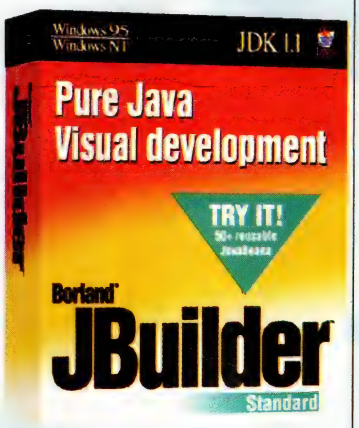
NEW PRODUCT

JBuilder delivers 100% Java code creation in a fully scalable, extensible and reliable environment

With its 100% pure Java code creation, JBuilderis most productive visual development environment will give your company a competitive edge. JBuilder provides what your business requires most: scalability, extensibility, and reliability.

JBuilderis best database integrates and support allows the creation of professional business applications that scales from the desktop all the way to the Enterprise.

JBuilderis open architecture based on JavaBeans delivers an unmatched extensibility that lets you create, use and reuse JavaBean components. By supporting industry standards, JBuilder lets you create applications that wonit confine you to a proprietary standard. In addition, JBuilder provides a reliable environment based on the latest JDK 1.1, a solid architecture, and a well-proven compiler technology.



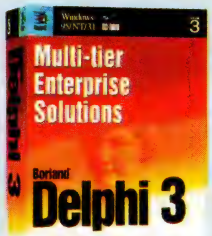
Features

- Component Designer lets you visually design Java components or applications
- Large library of reusable BAJA/Java Bean components
- Supports 3rd party and user defined components
- Two-way tools keep visual design and source code in sync
- AppBrowser provides fast negation and management of source code.

Stock Code BOR170

$149

Borland Delphi 3.0



Delphi 3.0 the high performance RAD tool for windows and C/S development.

Delphi 3 delivers a competitive advantage to the professional developer by combining visual component-based design with the worlds fastest compiled performance and the most comprehensive set of client and server development tools for creating distributed enterprise and Web-enabled applications

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BOR151	Delphi 3.0 Professional C/G	$459
BOR150	Delphi 3.0 Professional U/G	$259
BOR148	Delphi 3.0 Client Server	$2599
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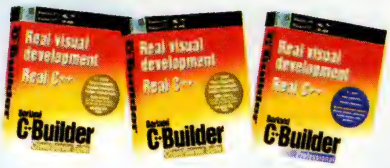
Borland C++Builder

Real Visual Development. Real C++ Now, for the first time, use C++ for all stages of development, from prototype to production. With new C++Builder, you get the unprecedented power and control of C++ in a fast, flexible, and visual Rapid Application Development (RAD) environment.



BOR138	C++Builder Standard 1.0 -CD	$159
BOR139	C++Builder Professional 1.0-CD Crossgrade	$349
BOR140	C++Builder Professional 1.0-CD	$849
BOR141	C++Builder Client/Server 1.0 Crossgrade-CD	$2149
BOR142	C++Builder Client/Server 1.0-CD	$2599
BOR143	Learn to Program with C++ Builder 1.0	$89

IBM VoiceType Simply Speaking for Windows 95 & NT

NEW PRODUCT

IBM's new dictation software, VoiceType Simply Speaking, is for anyone who would rather talk than type. Imagine sitting in front of your computer and simply saying what you would normally type. Just plug in the headset microphone, which is included in the box, complete the easy installation process and start using your computer in a new, fun and productive way.

VoiceType Simply Speaking uses IBM's award winning VoiceType speech recognition technology and is the result of more than two decades of IBM research and development expertise. This means that every component of the program has been developed and tested to the highest industry standards.

VoiceType Simply Speaking works on desktop and mobile computers and is ideal for students, home computer users and small offices. It requires Windows 95, and a Pentium 100 MHz computer with 16 MB RAM, 38 MB of free hard disk space, a double speed CD-ROM drive, and a SoundBlaster 16 or MWave compatible sound card.
Now virtually anyone can start talking to their computer with IBM VoiceType Simply Speaking - it's fun, fast and easy.

Whatever you normally type, you can simply say it with VoiceType Simply Speaking

* Catch up on correspondence
* Dictate e-mail
* Complete Essays, theses, reports and more!
* "Simply speak" lesson plans, lectures and speeches
* Finish writing that book!

Typical Uses

* Correspondence
* E-mail and faxes
* Reports
* Essays and assignments

Features:

- Typical accuracy of over 95% after optional enrolment
- VoiceType Simply Speaking learns as you use it, steadily increasing in accuracy
- Recognises 'discrete' speech (speaking with a slight pause between words) at speeds of 70-100 words per minute
- Includes a vocabulary of 30,000 UK English words, with room for 27,000 additional words
- Dictate with your hands and eyes free
- Full audio playback of your dictation if required for corrections

Designed for Microsoft Windows 95

STOCK CODE: IBM070

$95

IBM071 Simply Speaking Gold $195

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Lotus SmartSuite 97

The only desktop solution for your team!

SmartSuite 97 delivers a complete set of up-to-date, 32-bit applications specifically designed to take advantage of Windows 95 and Windows NT. Each application provides support for long file names, drag and drop, multitasking, and many of the other features of these advanced operating environments.

Office suites have changed substantially since the category in the late 1980s. From loose collections of applications, such as spreadsheets, word processors and databases, suites have evolved to offer consistency among applications, cross-application integration, and streamlined access to applications, files and tools. Since mid-1995, however ,several market and technological forces have changed the way suites need to work today:

- **Internet/Intranet:** the striking popularity of the Internet has piqued users' interest in harnessing Interest-based information in business. SmartSuite 96 was the first suite to deliver specialised tools for finding, publishing, and sharing Internet information, and Lotus continues to innovate in integrating Internet use with "everyday work" with SmartSuite 97.
- **Working as a Team:** Businesses have team members all over the world. The ability to use software to work collaboratively has made suite users eager for more dedicated tools that make it fast and easy for teams of co-workers to create, review, refine and publish documents of all types. SmartSuite 96's "Team Computing " features defined the standard for desktop-based collaborative tools, and Lotus continues to lead in this area.
- **Up-To-Date** Technology and tolls: The availability of 32-bit operating systems, including Windows 95 and Windows NT, provides the technical foundation for delivering advanced workflow, cross-applications automation, and more aggressive exploitations infrastructures. SmartSuite 97 provides a full suite of 32-bit applications which exploit the operating environments.
- **Access to information from Anywhere:** Businesses need to access information from anywhere – the Internet, proprietary databases, host systems, line-of-business software, real-time data, and the full spectrum of PC-based file types . SmartSuite provides tools to find and retrieve all of the information users need.
- **One size Does Not Fit All:** Businesses know what is best for them, and work the way they need to. Lotus knows that the "one size fits all" mentality does not fit in today's business world. Users need to personalise their application software, developers must build custom business solutions, and IS managers require more control of software deployment across organisations. SmartSuite 97 provides new features that accommodate each of these groups.

Designed to take advantage of Windows 95 & Windows NT

NEW VERSION of SmartSuite 97

Full Exploitation of Windows 95 and NT

Windows 95 and Windows NT 4.0 have created a new set of expectations for the look and behaviour of applications. SmartSuite 97 is fully integrated with both of these operating systems, and builds on them to make the user's migration to Windows 95 and NT-based applications as productive as possible. SmartSuite applications deliver:

- The Windows 95 and Windows NT look and feel
- Support for long file names and Universal Naming Convention (UNC) paths
- Advanced OLE 2 automation
- 32-bit performance and enhanced memory management

Every application in the suite includes a host of innovations and improvements designed to help users:

- Increase their individual productivity
- Access data from anywhere
- Leverage the power of the Internet and Intranets
- Customise applications to work the way they want
- Share and collaborate more efficiently

SmartSuite 97 provides a full suite of 32-bit applications which exploit the operating environments.

Surf the Net with Lotus® SmartSuite®!

The suite that brings the world to your desktop!

SmartSuite 97

- **Lotus 1-2-3 97** is a completely redesigned, 32-bit spreadsheet that delivers a host of new and enhanced capabilities to automate everyday tasks and simplify processes.
- **Lotus Word Pro 97** provides users all the tools they need to quickly and easily create powerful, compelling, great-looking documents.
- **Lotus Approach 97** leads the database world in delivering an unparalleled combination of ease-of-use and power.
- **Lotus Freelance Graphics 97** continues its long tradition of simplifying the creation and delivery of highly effective presentations.
- **Lotus Organiser 97**, the award-winning personal time management system, is now a complete 32-bit product with support for Windows 95 and Windows NT.
- **Lotus ScreenCam 97** is a fast, easy way for users to show what they mean when they can't be there in person. With ScreenCam, a PC acts as a VCR to record every on-screen click, scroll, and action. Captions and sound can be added to create mini-movies, delivering marketing messages, on-line tutorials, or product demonstrations. These on-line movies can be shared with anyone, even if they do not have ScreenCam installed. ScreenCam is a completely redesigned, 32-bit application.
- **Lotus SmartCenter 97**, the Suite's customisable command centre, keeps users organised and gives them ready access to their work-in progress, calendar and address book, and even the Internet. Just a click away, SmartCenter's drawers provide a central place for users to get the latest news and weather, organise the day's work, find reference material, or write themselves a reminder. New drawers in SmartCenter 97 give users fast automatic links to the Internet to search for information and favourite bookmarks, and get just-in-time help from Lotus Support Pages on the Web.

Lotus

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All Welcome! — We always service the individual buyer, small business and large corporation to the same high standard.

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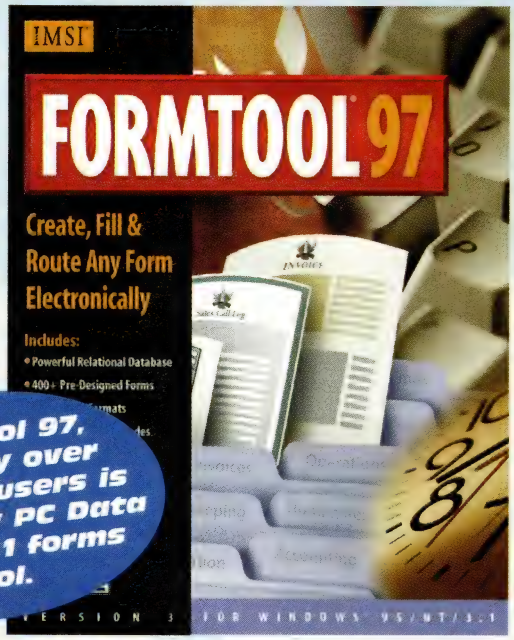
FormTool '97

Quickly and easily create professional forms

FormTool 97 is the easiest way to create, fill and automate any form. With its powerful and easy-to-use design and editing tools, you will creating professional looking forms and saving time and money.
FormTool 97 is the easiest and fastest way to automate any form. FormTool 97 now includes networking features including sign and send and electronic approvals. With a click of a mouse, you can add lines, circles, check boxes, pictures, text and more in colour. Included in this package are over 400 professionally created form templates: Invoices, purchased orders, expenses, reports and many other commonly used forms! Customize any form with your log and address in minutes. Your whole entire office can access and fill out forms over your network. And to get your office started, we've included a 3-user form-filler license. Then you can use FormTool's e-mail ready "Sign and Send" feature to electronically route your approval.

Top Features

* New networking features include: Electronically send the form to a group of people via your e-mail system, signature block for electronic approvals, and the ability to protect the data to the layout and field level with password control.
* FormTool 97 allow users to store, sort, and create reports with the new relational database feature. Access data directly from any X-Base compatible format, Dbase III or IV.
* Easy form design or customize your choice of over 400 pre-designed forms.
* Separate Filler module allows other users to access a FormTool form across a network for filling as well as accessing associated data.
* Familiar Microsoft Office compatible interface. Menus and floating toolbars all user standard MS names and images which make them easily recognizable.



FormTool 97, used by over 600,000 users is ranked by PC Data as the #1 forms tool.

IMS022	FormTool 97	$129
IMS049	FormTool 97, 5 user	$419.95
IMS050	FormTool 97, 15-49 user	$63 each
IMS051	FormTool 97, 50-99 user	$50.50 each
IMS052	FormTool 97, 5 100 +user	$37.80 each

- *Includes 400 professionally created templates applications*
- *Send & Sign Feature*

IMSI™ WINDOWS MAGAZINE 1995 WIN 100 Designed for Microsoft Windows 95 WINDOWS 3.1 COMPLIANT WINDOWS 95

Net Accelerator

Go 12x Faster on the Internet!

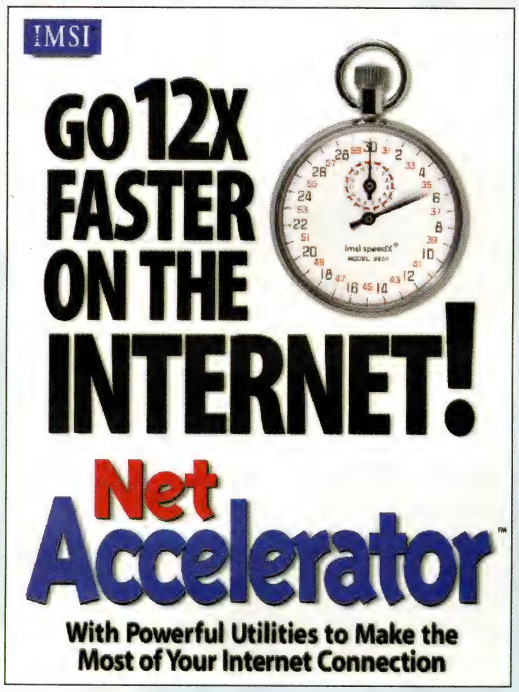
NetAccelerator speeds you through more of your favourite pages by maximising the efficiency of you modem, browser and telephone line. Whenever you pause to view a site, NetAccelerator stays busy behind the scenes seeking out available links and downloading the related graphics and text. When you choose a link, the downloadable page appears instantly.
NetAccelerator adds the efficiency you need to get the most from your time Online.
NetAccelerator is the most efficient way to navigate the Internet by saving your time and money.
NetAccelerator speeds you Internet Explorer or Netscape web browsing by using the idle time of your modem, intelligently load web pages in the background. Whenever you pause to view a site, NetAccelerator stays busy behind the scenes seeking out available links and downloading related graphics and text. When you choose a link, pictures and text appear instantly! Users will benefit by having faster access to web pages without any special hardware.
NetAccelerator works with standard modems, ISDN and direct network connections.

Includes Internet FastFind from Symantec. A suite of powerful search utilities for the Internet.

Features:

- Look-ahead catching including graphics
- Intelligent caching, utilising the built-in caching support form Internet Explorer or Netscape
- Automatic updates from the web
- Support for both Netscape and Internet Explorer on the same machine (including multiple instances)
- 32 bit only
- Small installation size (2.0 MB)
- Support for Netscape 2.0 and higher Internet Explorer 3.0 and higher

IMS021 NetAccelerator $49



WINDOWS 3.1 COMPLIANT WINDOWS 95 WINDOWS MAGAZINE 1995 WIN 100 Designed for Microsoft Windows 95 IMSI™

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BUSINESS SOFTWARE

IF YOU CAN FIND IT CHEAPER CALL US - WE WON'T BE BEATEN!* *See page 3 for Price Pledge

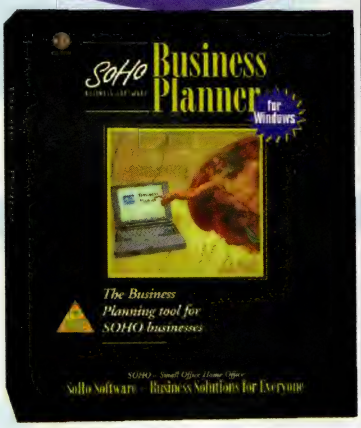
Business Planner

Business Planner helps businesses construct Business Plans.

SoHO BUSINESS SOFTWARE

Business Solutions for Everyone

Business Planner is designed for SOHO (Small Office/Home Office) businesses but with sufficient rigour to be used by larger businesses. An on-line database contains Section Headings window which is your gateway to all sections needed for a comprehensive Business Plan and the unique Section Assistant explaining what the user should consider for each section of their plan. Business Planner also contains Section Template windows that provide sentence prompts that can be used for each section. A proforma plan is also supplied on the database.
Business Planner also comes with an integrated word processor and spreadsheet.
Business Planner runs under all versions of Windows and supports Dynamic Data Exchange allowing users to copy documents into their plans and export plans to their own word processor.. Multiple plans can be stored multiple plans can be opened simultaneously.
An on-line help and a glossary of planning terms are also supplied.



Designed for Microsoft Windows 95

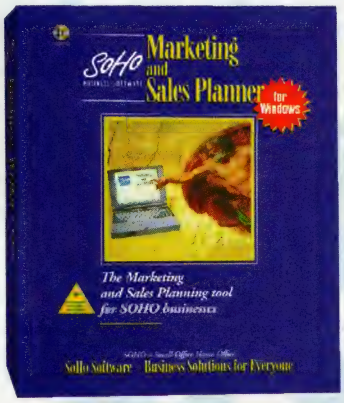
Developed and made in AUSTRALIA

SOH001 **Business Planner** **$129**

Marketing and Sales Planner

Marketing and Sales Planner helps businesses construct Marketing and Sales Plans.

Marketing and Sales Planner is designed for SOHO (Small Office/Home Office) businesses but with sufficient rigour to be used by large businesses. It contains all you need to construct a comprehensive Marketing and Sales plan and with the unique Assistant Windows prompting and explaining what the user should consider when designing their plan. Including in each section of Marketing and Sales Planner are Template windows which contain sentence prompts. A proforma plan is also supplied of the database. Marketing And Sales Planner also comes with an integrated word processor and spreadsheet facilities.
Marketing and Sales Planner runs under all versions of Windows and supports Dynamic Data Exchange allowing users to copy documents into their plans and export plans to their own word processor. Multiple plans can be stored and multiple plans can be open simultaneously.
An on-line help and a glossary of planning terms are also supplied.



Developed and made in AUSTRALIA

Designed for Microsoft Windows 95

SoHO BUSINESS SOFTWARE

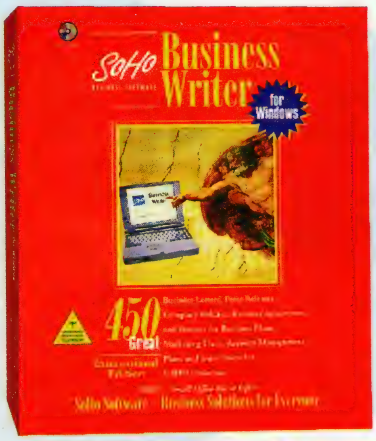
SOH002 **Marketing and Sales Planner** **$69**

Business Writer

SoHO BUSINESS SOFTWARE

450 Great Business Letters

Press Releases, Company Policies, Legal letters, Business Agreements and formats for Business Plans, Marketing and Sales Plans, Account Management Plans and much more for SOHO (Small Office/Home Office) .
Documents are stored on an on-line database and can be retrieved into Business Writer's word processor.
Business Writer runs under all versions of Windows and supports Dynamic Data Exchange, allowing users to copy documents to their own word processor. New documents can be created and stored in an on-line user database, together with variable fields for later replacement.
An on-line help and glossary of business terms are also supplied.
Always have on-hand the right marketing and business letter.



Featuring:
* **Marketing Letters**
* **Business Letters**
* **Legal Letters**

Designed for Microsoft Windows 95

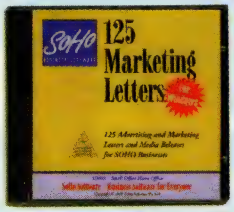
Developed and made in AUSTRALIA

SOH003 **Business Writer** **$55**

(Also sold seperately)

125 Marketing Letters

125 Marketing and Sales Letters. A subset of Business Writer, it comes with the full functionality of Business Writer including an on-line help and a glossary of business terms.



SOH004 **125 Marketing Letters** **$19.95**

125 Business Letters

125 Business to Business Letters for customers and suppliers.
A subset of Business Writer, sold separately comes with the full functionality of Business Writer including an on-line help and a glossary of business terms.

SOH005 **125 Business Letters** **$19.95**

125 Legal Letters

125 Legal Letters, Notices and Agreements. A subset of Business Writer sold separately comes with the fully functionality of Business Writer including and on-line help and a glossary to business terms.

SOH006 **125 Legal Letters** **$19.95**

www.sohosoft.com.au for more information on SOHO

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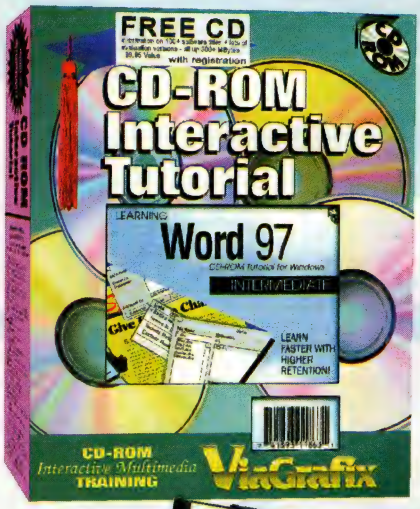
These tutorials are fully interactive providing between 4 to 6 hours of handy hints, tips and examples. Bring yourself or your staff up-to-scratch on the latest software.

ViaGrafix makes it easy. Learn at your own pace - you always have the choice to click on a continue button to move to the next screen. ViaGrafix also tells you what to do next. There is an operation line at the bottom of each information box that tells you where to click or what to type. The user interface appears as a row of buttons at the top of an information box. These allow the user to move forward, backward, jump to a specific topic, repeat what was said, or exit back to the chapter selection menu.

When you click on the "topic" button, a box appears showing different subjects within the related chapter. By clicking on the topic of your choice, you will jump directly to this subject. Also, a chapter selection menu allows you to choose any of the different chapters available on the CD-ROM.

There's a huge range of tutorials available for Windows, MS Office 95/97, Internet and most other software at all levels - just ask if it's not advertised.



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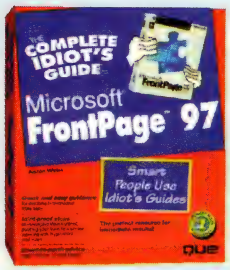

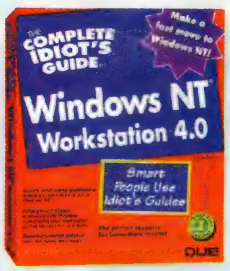

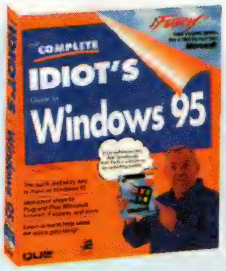

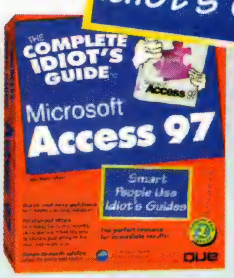

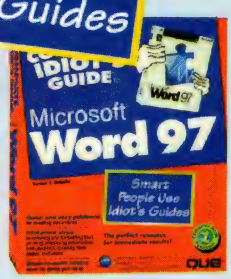

MICROSOFT FRONTPAGE 97

This is the fun and easy way to learn the basics of creating your own Web site. The Complete Idiot's Guide to Microsoft FrontPage 97 presents all the information you need to know in a language that's easy to understand in an approach that's fun.

IDI001 MS FrontPage 97 ..$24.95

WINDOWS NT WORKSTATION

Push aside the bulky books! The Complete Idiots Guide to Windows NT Workstation 4.0 presents a quick, step by step overview of Windows NT 4.0. Its approach is perfect for new and upgrading Windows users who need to quickly take advantage of everything Windows NT 4.0 has to offer.

IDI002 Windows NT $24.95

WINDOWS 95

Unlock the secrets of Windows 95. The Complete Idiot's Guide to Windows 95 is ideal for beginners and casual users and presents in a light-hearted, entertaining approach that covered all the important features of Windows 95. You'll quickly overcome your computer-phobia and get on with enjoying and maximizing the use your computer.

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ACCESS 97

Access 97 boasts all kinds of new features - Web publishing capabilities, customizable menus Database Wizards and much more. Taking away the pain of databases, the Complete Idiot's Guide to Microsoft Access 97 presents all the information and tricks you need to know in a language that's easy to understand.

IDI004 Access97.....$24.95

WORD 97

Don't get left behind. Word 97 is now out and with the Complete Idiot's Guide to Word 97, cover all the basics of this new and powerful word package. Find out the easy way to format pages, use templates, create Web pages and much more.

IDI005 Word 97 .....$24.95

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CreataCard

Over 3,000 cards you can personalize and print!

Give your cards, signs, certificates, awards, invitations, and stationery a personal touch with CreataCard Plus.

CreataCard comes with a huge range of cards as well as tools to create cards from scratch with an easy and fun-to-use interface. Design cards for business or personal use, simply and quickly. You can even create your own Screen Saver

You need never forget to send cards with CreataCard Plus Forget Me Not Reminders. Remember important events with this built-in reminder system, including calendar and address book. Use your address book to print envelopes, too.

MICROGRAFX

CreataCard Plus features:

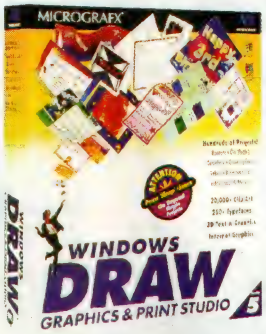
- Signs, certificates, awards, invitations, stationery and more
- Personal Delivery - a remote printing and sending service.
- Tools to create from scratch and an easy and fun-to-use interface.
- Forget Me Not Reminders
- Picture Painter Screen Savers

MGF011 CreataCard Plus **$39**

Windows DRAW 5 Graphics & Print Studio

MICROGRAFX

Windows DRAW - by far the best value in graphics for the home and small office computer user.



Features

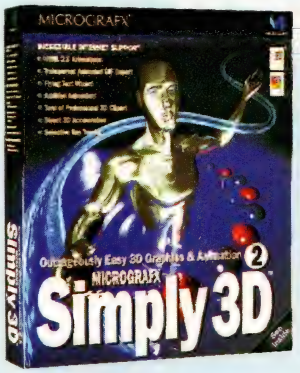
- Offers a comprehensive set of graphics tools at an unbeatable price.
- Comes complete with more than 300 ready-to-print designs.
- Has Microsoft Office Compatible interface, thus reducing the learning curve.

This Windows 95 graphics and printing studio for the home and office includes drawing, diagramming, 3D text and graphics, internet graphics, photo editing, painting, and a drag-and-drop clip art manager, plus more than 20,000 clip art and photo images and 250 fonts. Windows DRAW 5 also includes more than 300 ready-to-print designs for the most common graphics projects, so both novice and experienced graphics users will be productive and creative immediately. Project designs include banners, certificates, business cards, calendars, direction maps, space plans, flowcharts, org charts, greeting cards stationery, and many more.

MGF016 Windows DRAW 5 ..... **$65**

Simply 3D2

Outrageously easy 3D graphics and animation!



Simply 3D2 gives any user a powerful 3D and animation product, packed full of functionality.

This revolutionary new 3D and animation product has been designed to enable anyone to instantly add stunning 3D graphics and animations to documents, presentations and Web pages.

Its real-time modeling, drag and drop animation, and TEXT wizard combined with full Internet support through VRML2 and animated GIFs make this a highly productive and easy to use 3D graphics tool that is just waiting for your to explore!

MICROGRAFX

Features

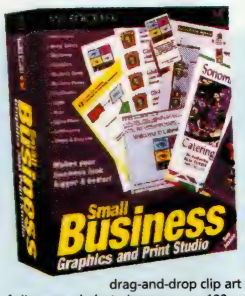
- The Text Wizards that allow you to create 3D text, simply drag and then drop into any object or text
- Over 300 materials that you apply to your own objects
- 500 fully textured 3D clipart objects - in useful categories
- Drag and drop editable animations - just drop on animation and hit the play button
- Drag and drop light and material scenes - speed creation
- Web Ready VRML2.0
- Animated and transparent GIF output for Internet - create animated GIFs easier than ever
- OLE 2.0 support - use inside Microsoft Word, PowerPoint and other OLE 2.0 capable prods

MGF015 Simply 3D2 ..... **$115**

Small Business Graphics & Print Studio

MICROGRAFX

All the tools needed to make small businesses look bigger and better!



Small Business Graphics and Print Studio is an integrated set of graphics applications for Windows 95 and NT 4.0, providing small businesses with professionally designed content, project wizards, and graphic tools all designed to make their businesses bigger and better.

The Microsoft Office Compatible applications in the studio include Windows DRAW 5 for drawing, diagramming, and internet graphics; Picture Publisher 6 for photo editing and painting; Instant 3D for 3D text and graphics; and ABC Media manager for drag-and-drop clip art management. Also included is more than 20,000 pieces of clip art and photo images, over 100 sample logos, and 250 fonts.

Small Business Graphics and Print Studio is by far the best value in graphics to help small and home based businesses look more professional.

Features

- Hundreds of ready to print designs
- Over 20,000 clip art and photo images
- Over 200 ReadyUse Web graphics
- A comprehensive set of Freehand drawing and diagramming tools
- Create eye-popping 3D text and graphics with instant 3D
- PaperDirect pre-designed papers
- Picture Publisher 6 adds impressive photographics editing and painting capabilities.
- Use ABC Media Manager to preview 20,000+ pieces of editable clipart and photo images.

MGF007 Small Business Graphic Print Studio **$89**

Choose a Free CD with every order!

1. **MasterClips 1000**

A collection of professional colour clipart

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Manage your diary, contacts, meetings and communications via the Internet

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Learn all about the human body with multi-media guide.

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The most significant release of any CAD software this decade

5. **EZ Language Version 1**

EZ Language V1 is the fun & easy vocabulary pronunciation tutor for 7 different languages

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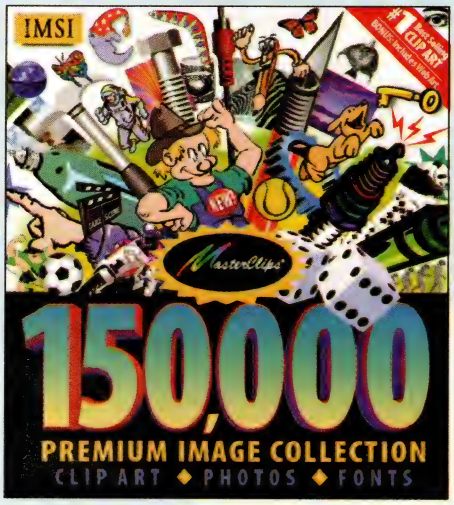
Why MasterClips is the Premium Image Collection!

With MasterClips 150,000 you'll get an incredible collection that includes all the clip art, photos, fonts sounds, web images and video clips you've ever wanted. Each image has been hand picked to ensure the highest quality for maximum impact. You'll find a variety of art that will give all your creations 'the professional look'. Search for the perfect image using either the global cross-category browser or the printed image catalogues. With MasterClips 150,000, you get a truly remarkable , premium image collection!



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Features
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- 40,000 etchings, drawings and engravings
- 26,000 spectacular photos
- 2,000 dazzling True Type fonts
- 500 of the most popular sounds
- 20 captivating video and animation clips
- web icons to liven up your page

MAS011 MASTERCLIPS™ 101,000 ..... **$79.95**

MASTERCLIPS 35,000 Collection

Features
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- 1,000 stunning photos
- 1,000 incredible True Type fonts
- 150 of the most popular sound effects
- full library of video and animation clips

MAS010 MASTERCLIPS™ 35,000 ..... **$45**

IMS015 MASTERCLIPS™ 35,000 (25 user pack) **$519**

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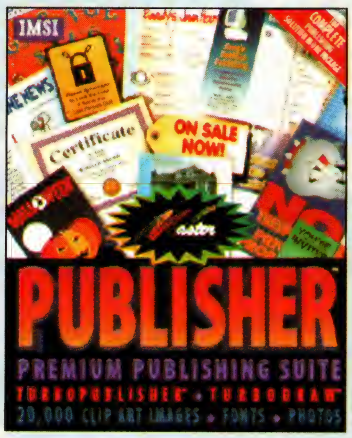
Master Publisher

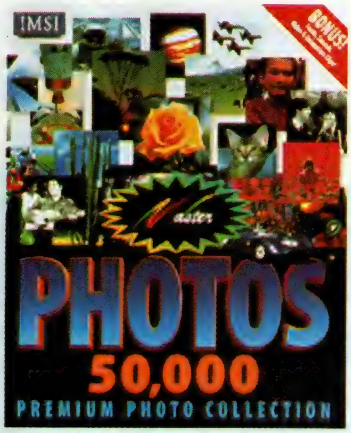


Master publisher Premium Publishing Suite gives you everything you need to be a Master Publisher in one package! TurboPublisher lets you lay out and design professional looking documents. TurdoDraw, a full featured drawing and illustration program, helps you create impressive graphics quickly and easily. Also included in Master Publisher are 20,000 Premium MasterClips images, 1,000 stunning MasterPhotos, 2,000 MasterFonts and the powerful browser lets you use keywords and the unique cross-category search engine to instantly find the images you need. Master Publisher Premium Publishing Suite is perfect for newsletters, brochures, greeting cards, signs, presentations, the Internet, school projects, desktop publishing and much more!

IMSI™

AUS160 Master Publisher..... **$79.95**

Master Photos 50,000 Edition

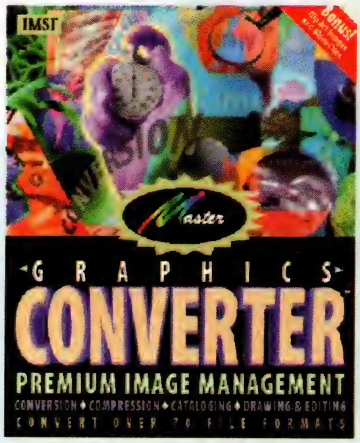


MasterPhotos™ includes 41,800 professional quality JPG photos, including historical images and 7,800 professional quality JPG images in 16 million colours. European Art, statues and more categories, 400 master photos aswell as all the fonts, sound effects and video you'll need for newsletters, signs, greetings cards, web pages, presentations, desktop publishing and much more.

IMSI™ SUPER VALUE

IMS035 Master Photos..... **$79.95**

Master Graphics Converter



MasterGraphics Converter is the easiest way to manage your graphics, photo, fonts, videos and documents. MasterGraphics Converter is perfect for converting images from one format to another, compressing files to save disk space and cataloguing content to help you find the images you need quickly. Plus, MasterGraphics gives you a powerful, vector-based editing and drawing tools as well as 10,000 clip art images from MasterClips and 20 video animation clips.

Features:
Convert to or from over 70 file formats including EPS, WMF, PCT or more.Compress your images to save valuable hard disk space
Catalogue your images, fonts and video clips into categories for libraries.

IMS036 Master Graphics Converter **$79.95**

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TurboCAD v4!

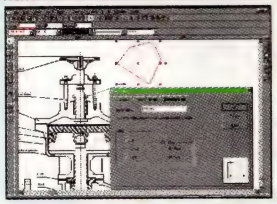
IMSI

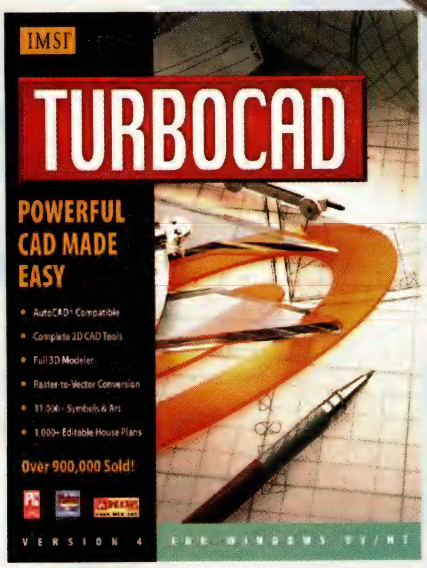
TurboCAD V4 continues to be the leading value in desktop CAD for the CAD hobbyist, home user or occasional professional user.

TurboCAD V4 offers a powerful solution for the easy creation, refining and communication of graphical ideas through drafting and design techniques. Built on an award-winning history, TurboCAD V4 delivers all the power and precision professionals need with simplicity. TurboCAD V4 is built around ease-of-use without compromising CAD functionality. The intuitive interface allows users to produce professional quality designs and diagrams in minimal time.

TurboCAD V4 offers a powerful solution for the easy creation, refining and communication of graphical ideas through drafting and design techniques. Built on award-winning success, TurboCAD V4 is build around ease of use without compromising CAD functionality or quality. The intuitive Interface allows users t produce professional quality designs and diagrams in minimal time.

These features, combined with advanced tools such as handle based editing, drag and drop symbols, single entry keyboard shortcuts, and raster to vector capability to make TurboCAD V4 the perfect CAD solution in its price range.





Features

- Handle-based editing
- DXF and DWG compatibility with AUTOCAD R13
- Basic interpreter and macro language
- Raster to Vector (Basic)
- Microsoft Office compatible interface
- Symbol browser
- Multi-level user interface
- Internet based help
- Online software synchronisation
- Single entry keyboard equivalents
- CAD edit bar with constraints
- Local context sensitive menus
- 1,000+ editable house plans
- 12,000+ Symbols & Art
- Full 3D Modeller

What the press Said:
"... It was clear to us that with TurboCAD V4 we finished the drawings more quickly and with less wasted motion, than on any other CAD product we can recall using over the past year..."
"...TurboCAD V4.0 is an excellent low-cost competitor to AutoCAD LT"
- Windows Sources Australia, May 1997.

WINDOWS MAGAZINE 1995 WIN 100 · PCPlus VALUE · WINDOWS 3.1 COMPLIANT WINDOWS 95 · PC Direct BEST BUY · AUTOCAD COMPATIBLE DXF DWG · CAD CAM RECOMMENDED · Designed for Microsoft Windows 95

STOCK CODE: IMS034

$189.95

TurboCAD V4.0 Professional

IMSI

The Professional CAD product for user in corporate and small business environments. This product was designed for CAD professionals in corporate and small business environments and third party developers. In other words, anyone who uses CAD or works in a CAD-oriented environment will benefit from using TurboCAD V4 Professional. TurboCAD V4 Professional supports all CAD file formats including AutoCAD R12/R13 DXF and DWG. TurboCAD V4 Professional provides all the advanced features required by corporate and business professionals, whether they are involved in computer-aided design as their primary daily activity, or as a more limited component of their work practice. TurboCAD V4 Professional's exceptional ease-of-use, open architecture and integrated Software Development Kit (SDK) allow this version of TurboCAD to deliver flexibility and performance that meets and exceeds the expectations of the most demanding users.

Award Winning software: *Widows Sources Stellar Award (US)*, *PC Magazine Editors Choice (US)*, *Windows Magazine Win 100 (US)*

Key Features:

- Handle-based editing
- Advanced filters for AutoCAD R13, DXF, DWF & DWG file formats, SAT (ACIS) solid models and EPS formats
- Customizable user interface
- Advanced Raster to Vector converter
- Microsoft Office compatible interface
- Software Development Kit allowing-access to TurboCAD's graphic engine
- Interence-based Internet Help
- Internet software synchronisation
- CAD Edit bars with constraints
- Full 3D modeller
- Local context sensitive menus
- Single entry keyboards equivalents
- 16,000+ Symbols and art
- 2,000+ editable home plans.

TUR012 Turbo CAD Pro **$499**

FloorPlan 3D Deluxe

IMSI

Design your complete home, office or garden quickly and easily with Floor 3D Deluxe.

Its full set of precision drawing tools help you create custom walls, floors, doors and window, Complete your design by using thousands of symbols, then walk through it in accurate 3D. FloodPlan 3D Deluxe also gives you TurboCAD 3D to create accurate 3D models, Garden Designer, and complete garden layout and planning guide, Quick & Easy Estimator to get an accurate estimate of your project plus 1500 home an office symbols and 1,001 Home Plans from Homestyles. FloorPlan 3D Deluxe is the premium home and office design suite.

Also includes:

- Quick & Easy Estimator - import your materials list for a cost estimate
- Garden Designer- design your dream garden
- 1,001 best-selling HomeStyle FloorPlans

Features:

- Design your dream home and office in minutes
- Includes a complete set of design tools
- Over 1500 3D symbols including home and office furniture, applications etc
- 3D Modeler and Symbol Editor lets you create custom symbols and rendered 3D models

THR009 FloorPlan Plus 3D **$89**

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QuarkXPress 3.32 for Windows

The professionals choice for publishing software worldwide

Soon after QuarkXpress was introduced, it became the standard for excellence in professional publishing. It offered new flexibility and un-heard of precision. Today, QuarkXPress remains the layout and design choice of the world's top publishers. In fact, most of the magazines and newspapers you are familiar with are created with QuarkXPress (this one is). When you need to create business cards, annual reports, full colour brochures, magazines, or catalogue, your publications will benefit from the precision, power, and flexibility of QuarkXPress.

The power of QuarkXPress is harnessed by a simple, intuitive, and elegant interface. Behind the interface is one of the most powerful publishing programs available. Seven floating palettes work together to give you quick access to the sophisticated colour, tools, measurements, document layout, and library controls that have made QuarkXPress the industry standard.

QuarkXPress offers the most sophisticated features available in any electronic publishing program. The included Efi-Color XTension ensures that the colour you see on the monitor matches the colour the colour you get off the press. Built-in trapping controls ensures that colours on the page fit together. With variable-shaped text boxes, automatic drop caps, colour blends, and the ability to flip and scale page elements, you have unlimited possibilities for page design – and the powers to realize those possibilities.

QUA003 QuarkXPress 3.32 for Windows **$1825**

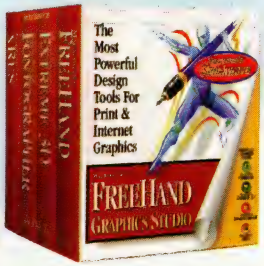
Freehand Graphics Studio

The Most Powerful Design Tools for Print & Internet Graphics

For Windows 95, Windows NT, Macintosh, and Power Macintosh

Move beyond the boundaries of print - take your designs to the digital edge of the Web with the FreeHand Graphics Studio and Macromedia Shockwave. This Studio contains everything you need for stunning graphics in any dimension. Bring the most powerful graphics software together in a single package.

Work seamlessly between all the tools in the Studio and with all your favourite applications.



Mac OS

Designed for Microsoft Windows'95

- **Freehand 7.0** The professional graphics tool for the Macintosh is now available for Windows. Long established as the tool of choice on the Mac, this latest version brings new levels of power, creative control and flexibility to professional graphic designers
- **XRes 3.0** a complete suite of hi-res image manipulation tools recently upgraded it now has 'full internet "streaming" support
- **Extreme 3D** The easiest and quickest way to move from 2D to 3D graphics with all the power the professional requires, now includes particle animation and meta forms for creating organic shapes and models
- **Fontographer 4.1** Gives you the tools to scan, edit or create your own fonts

MAC017 Freehand Graphics Studio (Win) **$695**

Photo Soap

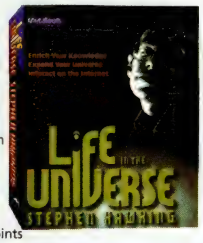
Clean up your image

It's a photo fact! You have to work with lousy photos now and then. So, make sure you've got Soap inside your computer. It fixes bad photos - better than anything else. Change and correct colours, fix "red eye" or remove wrinkles and scratches - all with the whisk of a brush. Crop, rotate, revise and close in real time. Yes, Kai's Photo Soap is a great way to clean up your image.

KAI005 Photo Soap **$95**

Life In the Universe

Stephen Hawking



What is life? How did it start? Could it exist on other worlds? Join Stephen Hawking, author of 'A Brief History of Time', on an interactive multimedia adventure that explores "life in the Universe".

The eminent cosmologist and, Professor Stephen Hawking's new CD will show you! His animated "Phage" assistant points the way across virtual 3D terrains, teeming with original animation, through-provoking essays and science games.

KAI011 Life in the Universe **$75**

KPT Actions

Yet another newley released product from Metatools. KPT Actions, the addition t Kai's Power Tools 3, allows Photoshop 4 users to take advantage of the Action Palette when using KPT filters. So, if you find the Action Palette a boon for your workflow and efficiency, KPT Actions will make it all the better by allowing you to use Actions with your KPT 3 plug-ins

MET008 KPT Actions **$89**

Bryce 2 Accessory Kit

Stunning Scenes in Seconds

Do you like Bryce? If so, you'll love the Bryce 2 Accessory Kit. Want to be able to access more textures without making them yourself? Want to have a greater choice of terrains and models? Want a sky setting that's just perfect for this job without tweaking for hours in the Sky & Fog controls? Then you'll want the Bryce 2 Accessory Kit - it's packed with modes, terrains, textures and presets - the Bryce 2 Accessory Kit gives you the ability to quickly create stunning Bryce scenes in minutes.

AUS401 Bryce 2 Accessory ... **$89**

AUS105 Bryce 2 ..... **$269**

Kai's Power Goo

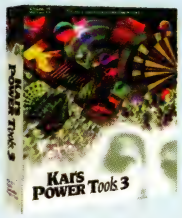
Get Totally Warped with Goo Effects

With this Variety of tools you can GOO absolutely anything you want. Maybe the image of a friend or a member of your family, a famous politician even the family pet can't escape the effects of GOO. Watch on screen as you smudge and alter their image with the revolutionary tool palette that is so easy to use.

"Prepare to be Goooed!!!"

KAI003 Kai's Power Goo **$94.95**

Kai's Power Tools

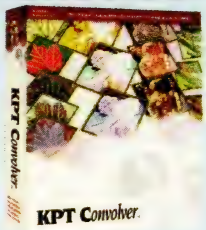


Power in Digital Imaging

Unlock your creativity with textures, 3D spheres and fantastic effects! Once you see Kais Power Tools in action you'll wonder how you ever created digital artwork without it! Kai's Power Tools unlock your creativity and expands the power of Photoshop! Design multi-colour gradients, infinite textures, 3D spheres and fantastic effects. Drag the awesome Lens f/x over an image and see real time previews of numerous filters like Pixel, Intensity and Edge!

KAI002 Kai's Power Tools **$185**

Convolver



Manipulation Control

One of the best manipulation tools for Photoshop! KPT Convolver is the first program to unlock the incredible power of the Custom Convolution Kernel, that area od imaiging mathematics that porvides the empirical structures which generate well known effects like Blur, Sharpen, Emboss, Edge detection, Unsharp Masking and more, within a single advanced user interface designed by Kai.

AUS106 Convolver **$185**

AUS402 Vector Effects ... **$185**

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Adobe Illustrator Version 7.0

Simply the finest illustration software

Award Winning

The award-winning Adobe Illustrator 7.0 simplifies the task of creating, manipulating, and refining artwork whether you're a desktop publisher, graphic artist, or on-line designer. Enjoy greater productivity with version 7.0's seamless integration with Adobe Photoshop and Adobe PageMaker programs, streamlined interface, speedy handling of large images, RGB colour support, precision, control of type, supports japanese fonts and more.

Compatibility: Seamless integration with the Adobe product family makes it easy to realize any concept. Or take advantage of new RGB colour support, and add your artwork to video. The new Web publishing features makes it easy to publish Adobe Illustrator artwork on the Web. Complete compatibility between the Macintosh and Windows 95 and Windows NT 4.0 platforms means that you can do your best work on the platform of your choice, and then freely move files between systems.

Enhanced colour management: Version 7.0 included ColorSync support for Macintosh and Kodak Digital Science CMC for Windows. Plus color separation support is built-in, for the impeccable quality you demand.

Match your imagination: Use multiple layers to overlay graphics and text, and freely add, remove, view, and hide any element. Choose from almost 50 special effects filter for distortions or nine art effects. Use improved sophisticated typographic tools and controls in Version 7.0 with convenient palettes, new vertical text tools.

Adobe

AD0047 Adobe Illustrator 7.0 (Win) **$729**

AD0054 Adobe Illustrator 7.0 U/G (Win) **$198**

AD0061 Adobe Illustrator 7.0 U/G (Mac) **$209**

Adobe Pagemaker 6.5

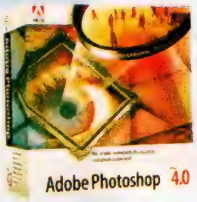
The hottest Desktop Publishing Software around

Open and work with files smoothly and easily.Adjust master pages and share files to keep projects on the move

AD0031 Adobe Pagemaker 6.5 (Win) **$979**

AD0032 Adobe Pagemaker 5.0 U/G (Win) **$199**

Adobe Photoshop 4.0



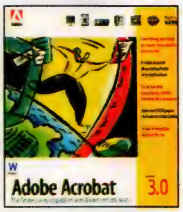
A camera for your mind

Create original artwork, correct colour, retouch images and prepare professional quality seperations and electronic output with more flexibilty than ever before.

AD0030 Adobe Photoshop 4.0 ..... **$979**

AD033 Adobe Photoshop 4.0 U/G **$299**

Adobe Acrobat 3.0



The fastest way to publish any document online

Create & share documents across platforms with their original look and feel intact.

AD0029 Adobe Acrobat 3.0 (Win) **$299**

AD0045 Adobe Acrobat 3.0 U/G (Win) **$109**

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A collection of professional colour clipart

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Manage your diary, contacts, mailings and communications via the Internet

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Learn all about the human body with multi media guide

4. **TurboCAD V1 Windows**

The most significant release of any CAD software this decade

5. **EZ Language Version 1**

EZ Language V1 is the fun & easy way to learn any premium vision tutor for 7 different languages

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A multimedia exploration of the life works of Leonardo da Vinci (the 3D genius)

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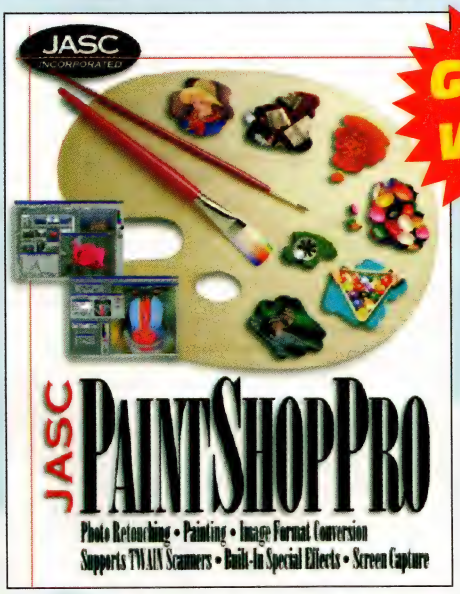
PaintshopPro - More than just a paint program!

NEW VERSION



Great Value

All the tools to create and edit all kinds of images, from web pages and photographs to screenshots and line drawings.

Plus screen capture and graphics conversion in a fast and easy to use package.

With a full range of brushes, extensive image controls, specially designed effects and support for industry-standard effects filters, Paintshop Pro offers the creative facilities of professional level products many times its price but remains fast enough for a quick change or a last minute polish. With screen capture and graphics conversion facilities its more than just a paint program and all at a remarkably low price.

Features

- Multiple selections
- Texture brushes
- Linear, Radial and Sunburst Gradient and Pattern Fills
- Choose any open image to use as a fill
- Create seamless tiles
- In-built special effects including Drop Shadow, Buttonize and Cutout
- Multiple line text with anti-aliasing and alignment
- Photo Retouching brushes allow you to apply photo retouching by hand Windows 95 and NT 4.00 only
- Supports Twain scannners
- Image format conversion

STOCK CODE: AUS224

$99

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Visio Standard 5.0

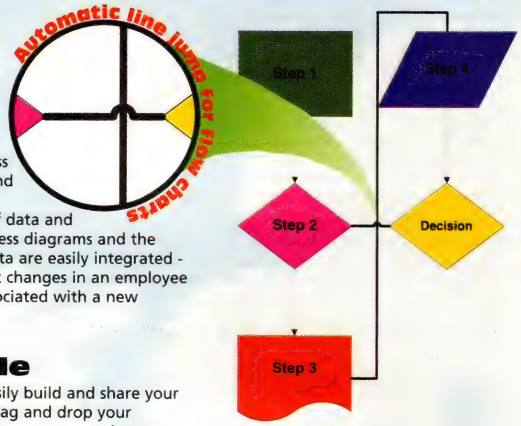
The smartest way to create all your business diagrams

With Visio you can easily create any kind of business diagram - everything from timelines to network diagrams to office layouts.

NEW PRODUCT

Diagrams for all business users

Visio Standard is designed to help increase the productivity of mainstream business users by allowing them to easily communicate and track work projects and flow, reporting structures, and concepts or systems. Visio Standard allows business users to visualise information commonly stored and distributed in databases and spreadsheets, thus avoiding complex and time-consuming analysis of data and figures. In addition, dynamic links between business diagrams and the databases and spreadsheets that hold the raw data are easily integrated - so an organisation chart can automatically reflect changes in an employee database, or a flowchart can report the costs associated with a new process.



Microsoft compatible

Visio is Microsoft compatible enabling you to easily build and share your business diagrams. Best of all you can simply drag and drop your diagrams into any OLE compliant word processor, presentation package, spreadsheet or other software.

Ideal for :

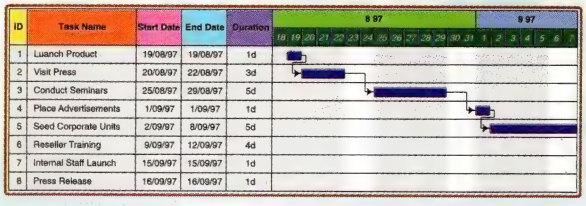
- Quality
- Sales & Marketing
- Finance
- Human Resources
- Administration

Features :

- Flowcharts
- Project Timelines
- Block Diagrams
- Relationship Diagrams
- Organisational Charts
- Network Diagrams
- Total Quality Management
- Mid Mapping Diagrams
- Office Layout
- Marketing Charts
- Geographic Maps
- Directional Maps

Supports Internet/Intranet Standards

Visio Standard also helps you get your visual information out to the people you need to via its built-in support for Internet/Intranet standards (HTML and ActiveX) and document management standards ODMA).



ID	Task Name	Start Date	End Date	Duration
1	Launch Product	19/08/97	19/08/97	1d
2	Visit Press	20/08/97	22/08/97	3d
3	Conduct Seminars	25/08/97	29/08/97	5d
4	Place Advertisements	1/09/97	1/09/97	1d
5	Seed Corporate Units	2/09/97	8/09/97	5d
6	Reseller Training	9/09/97	12/09/97	4d
7	Internal Staff Launch	15/09/97	15/09/97	1d
8	Press Release	16/09/97	16/09/97	1d

VIS100 Visio 5.0 Upgrade **$119**

VIS101 Visio 5.0 10 user license pack **$1825**

Designed for Microsoft Windows 95

$229

STOCK CODE: VIS099

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Technical

VISIO TECHNICAL

Create and share technical drawings

Visio Technical users are professionals using technical-orientated drawings. Visio technical is ideal for Engineers, designers, and architects who often need to communicate with technical measures and schematic drawings.

Visio Technical includes everything in Visio Standard as well as some powerful new features.

Its ability to import and export DWG/DXF files lets users share their Visio Technical drawings with AutoCAD users, and visa-versa. With Visio Technical's new Database Wizard, you can link a Visio Technical shape or drawing to external ODBC-compliant databases. It includes a 32-bit version for Windows, Windows 95 and NT 3.51 and Office 97 Compliant.

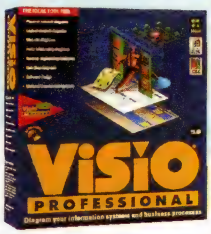
VIS102 Visio Technical Upgrade **$299**

VIS103 Visio Technical 10 user license pack **$3849**

$479

STOCK CODE: VIS107

For the IT experts!



Visio professional users are IT professionals- such as LAN Managers, IT directors, Database Analysts, Software Developers and Web Masters- and Business Process professionals. They need to visualise the IS infrastructure that underlies their organisation and the process that make their business run.

Visio Professional includes everything in Visio Standard and features great new content: new SmartShapes® symbols, like IDEFØ process shapes, over 350 new network equipment shapes; application development methodologies like Booch, Youdon, Fusion and more; all new wizards for database mapping and design/creation, web site and network diagramming; and improved database connectivity. In addition, Visio Professional includes Microsoft Visual Basic for Applications (VBA), making it even easier to create and distribute custom Visio solutions.

VIS104 Visio Professional Upgrade **$299**

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STOCK CODE: VIS106

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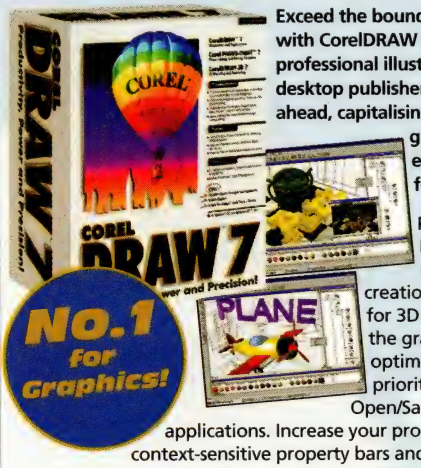
Productivity, power & precision!



No.1 for Graphics!

Exceed the boundaries of traditional design with CorelDRAW 7. Created for the professional illustrator, graphic artist and desktop publisher, CorelDRAW 7 leaps ahead, capitalising on its strengths and giving you even more enhancements and features.

Packaged with Corel PHOTO-PAINT 7 for photo editing and bitmap creation plus CorelDREAM 3D 7 for 3D modelling and rendering, the graphics suite makes optimum performance a top priority by delivering faster Open/Save and Redraw across all applications. Increase your productivity with new context-sensitive property bars and a revolutionary customisable user interface that lets you edit icons, arrange toolbars, toolboxes and more. Interactive tools and utilities provide you with on-screen feedback, making the design process so much more intuitive.

COR491 Corel DRAW 7.0 ..... **$670**

COR492 Corel DRAW 7.0 U/G (version 3 or later) **$379**

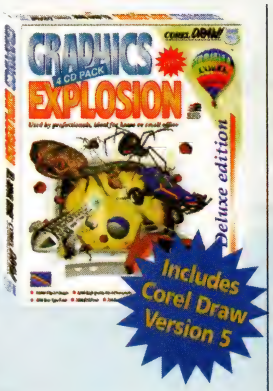
COREL Print & Photohouse

Corel Print & Photo House offers a comprehensive set of powerful drawing and photo-editing tools perfect for all your home office or small business projects.

With a full library of clipart images, ready-to-print sample files, photos, phrases, and fonts, creating professional-looking projects is easy. The fully customisable design tools are complemented by an intuitive interface to help you achieve the original look you want. Use the Notebook, a handy on-screen help feature, to guide you through tasks. Both novices and experts alike can design unique and personalised greeting cards, stationery, banners, certificates, business forms, signs, recipe cards, calendars, photo album pages and more, in a few simple steps.

COR490 Corel Print & Photohouse **$79.99**

Graphics Explosion Deluxe edition



Create stunning presentation, stationary, advertising material etc.

This exciting 5 CD Pack contains all you need to create stunning professional-looking designs ideal for the Professional, home & small office.

Just take a look at what is included:

Fully Upgradeable Corel Draw 5 - Corel Draw 5 is one the world's most powerful desktop publishing programs available. It is used by professionals for high-end desktop publishing and can also be used by the home and small office.

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COREL *Draw* - provides three tools for drawing objects.
COREL *Show* - helps assemble multi-page presentations using files from a range of applications.
COREL *Move* - an animation program where animation images are displayed.
COREL *Trace* - allows you to convert bitmap images into compressed vector format.

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Icons: - An excellent selection of over 12,000 assorted Icons - great for presentations or for enhancing your Desktop.

PLUS

ALL MOVIE GUIDE - The worlds largest fully cross referenced movie guide with over 90,000 movies.

UNBEATABLE VALUE

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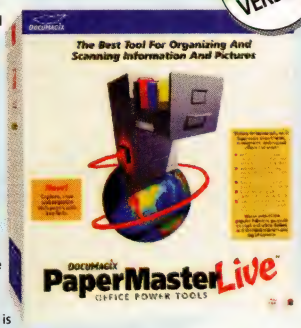
DocuMagix PaperMaster

Designed for Microsoft Windows 95

Put a real file cabinet inside your PC!

NEW VERSION

Award-winning PaperMaster is a powerful paper manager that puts a real file cabinet inside your Windows or Windows 95 PC. Because it's software, PaperMaster file cabinet can be unlimited in size, and lets you file, find, fax or e-mail all your papers instantly, It even lets you copy, annotate and edit documents, and it saves you time in filling out forms.



With PaperMaster, you'll have an easier time filling out memos, letters, receipts, spreadsheets, magazine articles, tax returns or even business cards in either black and white or colour! Anything that you want to file can be, even documents from the internet or an Windows application and if you can't find that file by name you can still visually find it or use it's amazing AutoSearch capability that allows you to find by title text, annotations or by any word! All in all this is definitely the software to get you organised in no time at all!

Features

- Organise all your papers, faxes e-mail and all your on-line documents!
- file once, find, fax, copy, e-mail, edit or annotate instantly.
- Scan 7 fill out forms effortlessly.
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- colour,grayscale or black & white support
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- Keep things personal with passwords!
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AUS148 DocuMagix PaperMaster **$179**

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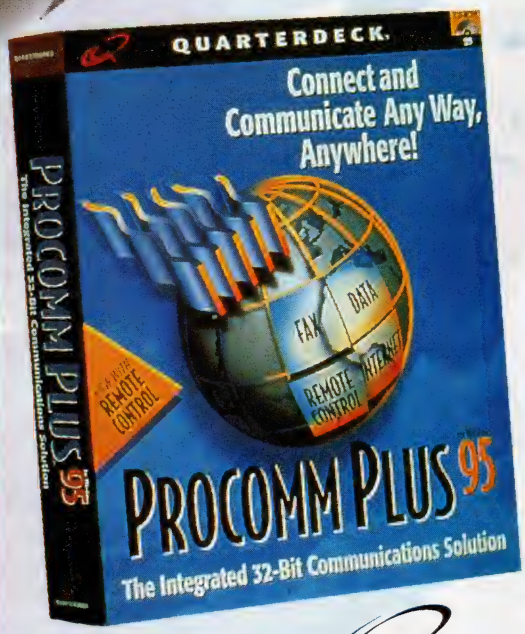

Compresses any file by up to 98%

The world's No.1 best selling communications software is the only complete solution to access all your PC communications from one source.

Whether you're cruising the Internet, sending or receiving a fax, or downloading a file from the office, Procomm Plus 95 has everything you need to communicate via your PC. Fax, Internet and Data functions are seamlessly integrated into one intuitive interface. The quickest, most reliable way to get the most from being connected. Procomm Plus 95 allows you to work at your computer the way you want to, moving from one activity toy the next with ease. Procomm Plus 95 also boasts the new feature Procomm Remote which allows you to connect from anywhere to control your office or home PC files and applications as if you were sitting there. Remote control is also a great way to read and send e-mail, share applications and files between your laptop and desktop.

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"...read all the review to appreciate the magnificence of the product"

"...easy to operate, a dream to install"

Micro Computer Mart

Features:

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- Data Transfer
- Connection Directory
- Web Browser
- Internet Mail
- Internet News Reader
- FTP and Telnet
- ISDN Support
- Aspect Script Language

QUARTERDECK

QUA039 Procomm Plus 95 (CD) **$219**

QEMM 97

QUARTERDECK

Get more from your memory - Load applications faster

With the new QEMM 97 you get the most from your memory for Windows 95, Windows 3.1 and DOS!

QEMM 97 picks up where Windows 95's memory management leaves off, loading 32-bit application up to 60% faster and dynamically reclaiming under-used memory, resulting in snappier application performance.

QEMM 97 automatically analyses your system and configures itself for top performance. By making memory usage under Windows 95 more efficient you can also run more applications at the same time. DOS applications, especially games can now run seamlessly from the Windows 95 desktop with full memory enhancing benefits of QEMM 97.

QEMM 97 now includes Update-It for automatic updates over the Internet, guaranteeing you always have the latest version.

With over 4 million copies sold and major awards, QEMM 97 brings a decade of know-how to your Windows PC. QEMM 97 is absolutely the best integrated set of memory management tools for Windows 95, 3.1 and DOS.

FEATURES

- Always the latest version- updates over the Internet
- Make a 32-bit applicaation up to 60% faster
- Makes windows 95 more efficient - run more applications at the same time
- DOS aplications especially games can now run seamlessly from the Win 95 desktop.
- Over 4 million copies sold and major awards

Designed for Microsoft Windows 95

QUA080 QEMM 97 ..... **$99**

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Essential Utilities 97
4 in 1 software Bundle

SUPER VALUE

Remove-It
RRP $59.95

The #1 way to get the garbage off your hard drive

Remove it is the most comprehensive removal system available for Windows 95. It safely and accurately removes any 32-bit or 16-bit application, duplicate or orphaned files, old faxes, unneeded backups and a host of other electronic debris that builds up on your hard drive.

ONLY $135

Fix It
RRP $85

The essential software diagnostic utility

Stop Windows 95 problems before they start instantly and automatically. The amazing new Fix-It is the easiest way to find and fix Windows 95 problems (guaranteed). With its amazing FIX IT button it could not be simpler.

Fix-It

Zip It
RRP $85

File compression has never been easier!

Quarterdeck's New Zip-It is the fastest and easiest way to compress view, ZIP and unZIP files in Windows 95 & 3.1. No more complicated long hand DOS prompt commands, a clean and easy to use interface making Zipping files a mouse click operation.

Partition-It
RRP $79.95

The essential hard drive management utility

Quarterdeck Partition-It is a revolutionary hard drive management utility specifically designed for today's hard drives. Partition-It automatically optimizes the storage capacity of your hard drive, and makes it easy to manage your data and applications for ease of access and better performance using hard drive partitions.

A MUST HAVE product for Internet users

QUARTERDECK

Designed for Microsoft Windows 95

STOCK CODE: QUA101

$135

CleanSweep 3.0
The World's leading uninstaller

Whisk away unwanted files and get better performance!

A hard drive can be a filthy place. If it were your living room, there'd be so much junk on the floor you wouldn't be able to get to the couch without tripping!

That's because every time you install a program, download a file, upgrade to a new version or perform even the most mundane disk operations, your computer dribbles a trail of digital debris all over - clogging up valuable hard disk space. It's time you called in the worlds #1 choice for safe file removal: Cleansweep, from Quarterdeck. The most popular way to clean up your hard drive. Cleansweep's award-winning cleaning power removes junk of every type:- duplicate files, redundant DLLs, orphan files and even infrequently used files. Just single-click the automated Wizards from the Windows Explorer to uninstall, backup or move any application. Special Registry features guide you through the toughest of file maintenance chores.

The exclusive safety sweep feature offers the best protection against accidental file deletion of any removal utility you can buy. CleanSweep even patrols your system all the time, recording the installation of new software. So you can remove brand - new software applications with 100% safety - whether they're in the application knowledge base or not.

CleanSweep is the only file removal software designed for Windows NT in addition to Windows 95 and 3.1 It's packed full of features that take full advantage of Windows 95 and NTs 32-bit environment.

Safety sweep "green lights" those files that are safe for you to remove

Update-it

CleanSweep can automatically update itself over the Internet, so you'll always have the most up-to-date application knowledge base

Features
- Finds and safely removes more files than any other program
- Safety Sweep automatically protects against accidental deletion of important files
- Smart Sweep automatically watches installations for the most effective uninstalls
- Application knowledge base of over 1,000 programs for the safest removals
- Automatically finds wasted space for instant savings
- Intelligently eliminates unused and duplicate files
- Easily moves programs to any location

QUARTERDECK

PC PRO RECOMMENDED

WINDOWS

Designed for Microsoft Windows 95

CLE011 CleanSweep 3.0 ..... **$69**

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One-click system recovery. First time.Every time. Guaranteed!

One-click Automatic system recovery

Have you ever installed a new program onto your PC only to find that your Windows system suddenly no longer works? You try to delete the new application, but can't because it has changed all of your system configuration files? Well have no fear, because the software lifeguard is here! Rescue Me! from the Kiss Software Corporation utilises state of the art technology to bring you a comprehensive configuration tracking and recovery tool for Windows '95, 3.1 and NT. With a single click of the mouse Rescue Me! can identify changes made to the system Registry, configuration files (including DLL's, EXE's and drivers), system hardware and network connections from

- Peace of mind for every PC user
- Saves technical support calls
- Don't run new software without it
- Unintrusive - does not tamper with original configuration
- Automatic snapshot
- Surf the Internet without fear

What happens if you can't load Windows? Rescue Me! allows you to Restore to any previous Windows configuration from DOS Prompt.

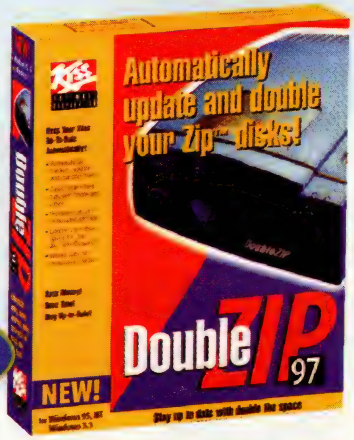
KISS SOFTWARE CORPORATION

KIS033 **Rescue Me! (Win 95,3.1)** **$49.95**

DoubleZip

Get more stuff into and out of your Zip disks!

At first 100MB Zip disks seem like all you'll never need. But file sizes quickly expand to the available storage space and you find yourself wanting even bigger storage. DoubleZIP 97 comes to the rescue with compression specially designed for removable storage such as ZIP drives. DoubleZIP 97 comes with a built-in applet so you DoubleZIPed disks (with twice the storage) can be shared with users just like regular Zip disks. Your files will still be totally portable and compatible with others, plus you gain double the space to store all your files! DoubleZip compression is 100% compatible with PKZip.



Auto update & double zip disks

Automatically backup, update and transfer files!
Easily share files between home and office
Synchronize your removable storage!
Double your disk space for ZIP, Jaz and Syquest!
Work with all removable media!

KISS SOFTWARE CORPORATION

KIS013 **Double Zip** **$39.95**

ImageCommander

Jasc ImageCommander is a quick and easy to use graphics viewer.

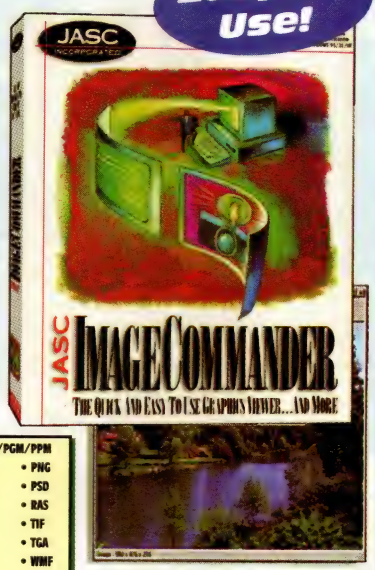
Easy to Use!

So many graphics, so little time. If you work with graphics on a regular basis, you need a viewer that is fast and easy to use. Don't waste valuable time waiting for another application to open a graphics file when it can be easily loaded in Jasc ImageCommander in a fraction of the time

Viewing Options
View Graphics full screen or adjust the zoom in or out on an image.

Colours
ImageCommander enables you to adjust an image's RGB and brightness, contrast values, as well as convert it to a grayscale or negative. In addition, you can decrease the colour depth of an image to 2, 16 or 256 colours.

Adjustments
With adjustment options such as flip, mirror, rotate, crop or resize you can quickly move areas or tailor the appearance of an image.



File Formats Supported			
• BMP/DIB/RLE (Windows)	• MAC	• CUT	• PBM/PGM/PPM
• BMP/DIB (OS/2)	• MSP	• DRW	• PNG
• CDR	• PCD	• DXF	• PSD
• CGM	• PCX	• GIF/RLE	• RAS
• CGM	• PIC (Lotus)	• GEM	• TIF
• CLP	• PIC	• HPGL	• TGA
• CMX	• PCT	• IFF	• WMF
		• IMG	• WPG (Wordperfect)
		• JIF/JPG	• WPG (Vector)
		• LBM	

Designed for Microsoft Windows 95

STOCK CODE:CMQ002

$35

ImageRobot

Image File Format Batch Conversion

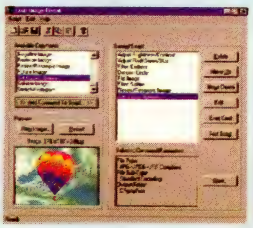
Do you ever wish you could apply filters or deformations or perform the file conversions from one graphic format to another without having to do so file by file?

Now it can be a reality with JASC ImageRobot

This program allows you to perform a wide variety of batch processing functions. No programming is necessary - simply select the image file and the batch process commands you would like to use and JASC ImageRobot will do the rest.

It works on the basis of a script, which contains the commands you have selected for the batch process. Processed images will be written to a separate directory for later viewing, leaving the originals untouched.

You can also save the actual script of patch processing commands for later use.



Features
- 11 Deformations
- 20 Filters
- Supports over 27 graphic file formats
- Palette Adjustments
- Process Logging
- Colour Adjustment
- Previews before batch processing

CMQ001 **ImageRobot** **$65**

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As Seen on T.V.

AntiVirus
Version 2.0

Automatic Virus Elimination — GOLD EDITION

#1 Worldwide Anti-Virus Market Leader
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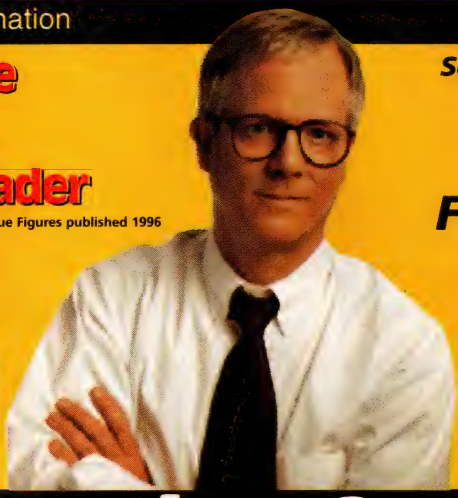

Supports Windows 95, Windows NT, Windows 3.0 and DOS

Free Updates Online

Virus Protection From;
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- Floppy Disks,
- Email
- Shared files
- Networks
- Macro.....

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$85

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Norton Utilities

Over 15 Million Users World Wide.

The experts choice

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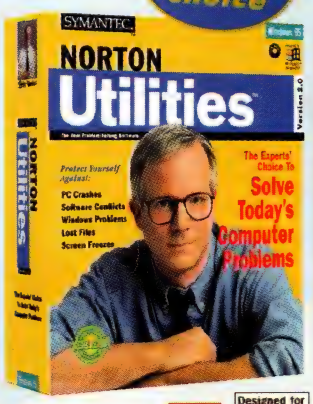
- Stops computer viruses before they damage your computer
- lets you customize Windows 95
- Monitors your favourite Web sites
- Automatically downloads software updates and patches



NOR032 Norton Utilities **$109**

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PC Handyman

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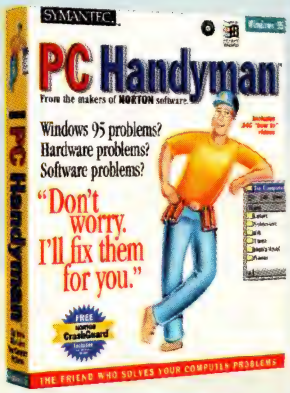
- From makers of Norton Software
- Save your work with Norton Crashguard
- Scans for viruses
- Automatically fixes:
  - Windows 95 problems
  - Thousands of software and hardware problems
  - PC crashes
- Includes 140 'how to' videos



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STOP WINDOWS FROM CRASHING!!! WITH RAMGATE!

It's frustrating when your PC crashes and, at worst, lose a files entire contents through corruption. Major problems you can encounter in Windows are:

Out of Memory
Insufficient Memory
Out of Resources
General Protection Fault (GPF) - commonly known as a crash
Illegal Operation (Win95 GPF)

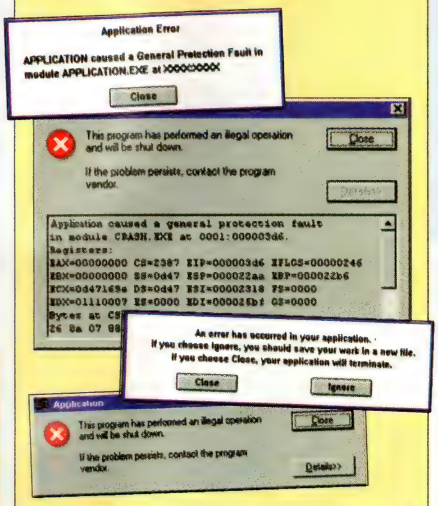
RamGate is a utility which stops Windows from crashing by controlling the way in which Windows applications access RAM, virtual memory and Windows system resources. The basic principle behind RamGate is simple; to use memory and resources contiguously. RamGate ensures that when an application makes a request for memory and resources, it is given a block immediately next to the previously allocated block. Additionally, a small buffer zone is built into the request for, and subsequent allocation of memory resources. This basic allocation method is in contrast to that of native Windows which will take memory and resources from anywhere. Contiguous use of memory and resources will provide for a more efficient operation of Windows as well as improved stability. This is why you will be able to safely run more applications than ever before.

- Protect Against GPFs
- Improve Stability
- Prevent Loss of Data
- Windows 95 and 3.1x
- Australian Business Software of the Year

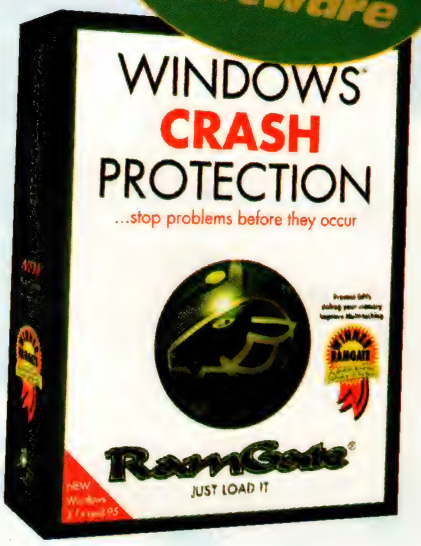
Designed for Microsoft Windows 95

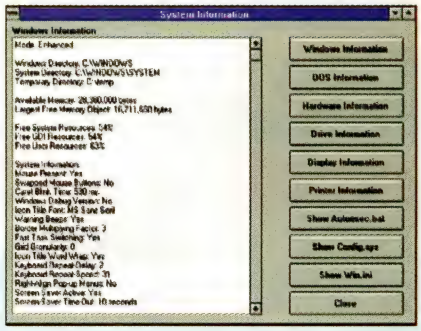
WINNER RAMGATE Australian Business Software of the Year

Have You Ever Been Annoyed by any of these Error Messages on your PC?



...then you need RamGate™





RamGate's easy-to-use interface makes navigating through your system simple.

RamGate is a Terminate and Stay Resident (TSR) program which, once initiated puts a protective layer around the system resources and memory and a shield inside Windows itself. The major benefits of RamGate are as follows:

- **Allows system resources to be utilised down to 0% free without an increase in the number of GPFs (crashes), which typically increase dramatically once free system resources drop below 35%**
- **PC performance is not impaired as free system resources fall below 35%. Typically, this is impossible to achieve in Windows**
- **Since approximately 30% of system resources is used by Windows itself, only about 35% of system resources are usable before the danger level for GPFs (crashes) is reached. With RamGate, the remaining 35% of free system resources becomes as stable as the resources in the 35-70% range, thus allowing the user to safely open many more applications**
- **No Windows system files are changed or modified making RamGate ideal for networks**
- **RamGate does not replace or modify any Windows files or application files**
- **RamGate effectively "Defrags" the FAT, RAM and Virtual Memory**
- **RamGate will run on Windows 3.1, 3.11, Windows for Workgroups, Windows 95 and Windows NT**

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RamGate Testimonials

"It manages Windows resources much better than Windows does. Testers found they could work with very low resources without crashing and run more applications at once"
Angel Ioannou - Senior Systems Engineer, Lotus Development. 27/6/95

"The RamGate professional product tested well on the Compaq Armada and LTE 5000 portable computer family. Compaq considers it a good investment for customers looking to manage their computer memory resources efficiently, without affecting their existing software configuration.
Vincent Bevan - Technical Specialist, Compaq Europe, Nov 1996

"It's a good product and appears to do what it says it does"
Greg Buchanan - Director of Software Support, Microsoft Asia Pacific. 27/6/95

"This product deserves special mention for a number of reasons. It's an Australian product, it has been very well received by users and testers and it works in a completely different way to the RAM doublers with which it's often confused in popular perception"
Neale Morison - PC World, March 1996

RamGate - Winner of the Australian Business Software of the Year Award - 1995-96
Competition sponsored by Channel 9, Quantas, Austrade and Optima Computer. Awarded ahead of 182 other entrants.

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RamGate - The PC utility your system can't afford to run without!

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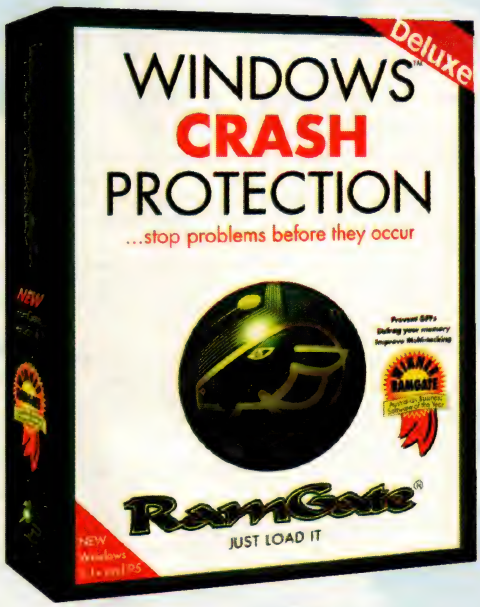
RamGate Deluxe

Place a protective shell around your applications

Ideal for mission critical applications

RamGate Deluxe does all that RamGate does and more.
RamGate has with its advanced technology introduced another superb crash protection utility RamGate Deluxe for mission critical applications.
RamGate Deluxe achieves this added stability by uniquely packing the memory heap each time a Deluxe configured application is launched. Secondly, Deluxe builds a small buffer zone into the applications request for memory and resources. This further reduces the likelihood of memory crashes, making Deluxe ideal for users who run mission critical applications.
Users may choose to run Deluxe supported application with the RamGate button. A single click of the RamGate button minimize the application. Deluxe also ensures that only one instance of an application is opened.



How RamGate™ Works:

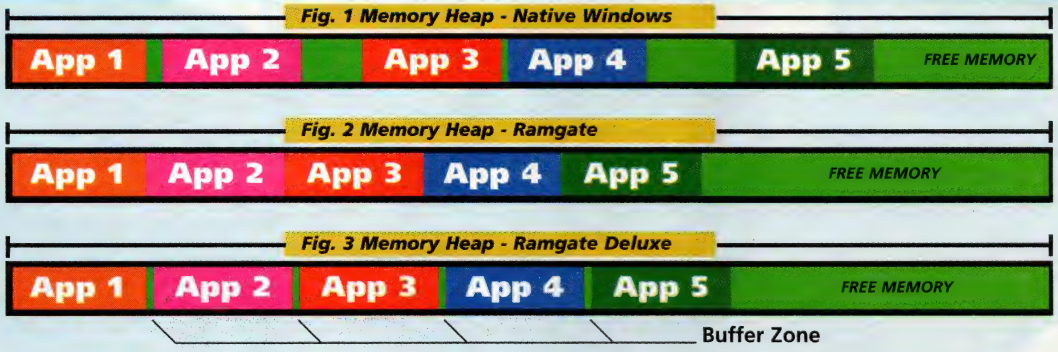
As memory heaps become fragmented, there comes a point when a request for memory cannot be met from a single block. As the requests for memory are made the chance of Windows attempting to access a block of memory that is already in use increases dramatically. This commonly occurs when systems resources are depleted (<35% in Windows 3.1 and <68% in Windows 95) When this happens, there is no way for windows to internally resolve the conflict and a General Protection Fault (GPF) occurs.

RamGate will pack the memory heap, ensuring that the maximum contiguous free block is created.
With RamGate Deluxe you nominate which applications are mission critical so as RamGate Deluxe will pack the memory heap each time a Deluxe configured application is launched. Secondly, Deluxe builds a small buffer zone into the application's request for memory and resources. It achieved this by intercepting the application's memory and resources request and then adds a small percentage to it. The allocation of a memory buffer zone creates a protective shell around each application and allows for the opening of many more files. This further reduces the likelihood of memory conflicts and resulting GPFs. The buffer Zones or protective shells are depicted in the diagram by the slight gaps between the applications in the memory heap.
RamGate cleans up the memory heap

\Re-booting Windows does not clean up the memory heap. RAM can become fragmented due to highly complex Windows startup routines and virtual memory can remain fragmented between Windows sessions until cleanup by RamGate.

NIT001 RamGate Deluxe..... **$199**

This diagram demonstrates how Ramgate Deluxe organises the allocation of memory and furthermore places a buffer zone betwen each block allocated.



RamGate Deluxe Testimonials

"This product deserves special mention for a number of reasons. It's an Australian product, it has been very well received by users and testers and it works in a completely different way to RAM Doublers with which it is often confused in popular perception".
Neale Morison - PC World, March 1996

"An Australian Software company has managed to do what Bill Gates can't do with his Windows operating systems".
Sun Herald - 1/12/96

"Ramgate does for the windoes resource stacks what a defragmenting utility does for the Hard Disk".
Jan Wikstrom - PC User Januery 1997

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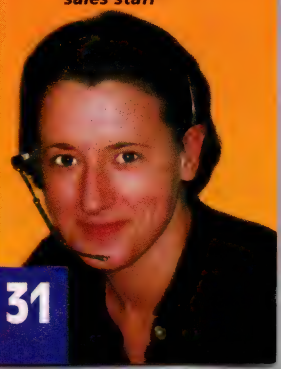

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If your PC has ever crashed, you will know why you need First Aid 97 !

Give your PC a compete physical

It can take hours to track down even a simple problem in your Windows system. When you call Technical Support you're put on hold for ages and when you finally get to speak to someone, it's difficult to explain the problem accurately, let alone implement a solution. Up to 90% of all Windows problems are caused by software conflicts. AutoFix technology automatically fixes software configuration and setup problems, intercepted and repaired faults *before* your work was lost and corrected software conflicts.

The makers of First Aid analysed thousands of Windows problems and then built the unique "AutoFix" technology to automatically sense and actually fix thousands of problems in your Windows system. Running in the background, First Aid pops up when it senses a problem and tells you what the problem is – in plain English. Then, a click on "AutoFix" corrects the problem. No other product available can do this!
First Aid 97 will revive your PC when it won't boot, automatically track all changes in your PC configuration files, plus connect you directly to the WWW pages of software vendors so you can download the latest bugs and fixes. Never call a tech-support line again - let First Aid 97 do all the work for you.

Give your PC a complete physical

First Aid gives your PC a "Complete Physical". Just click on Check-Up and First Aid checks every vital component and automatically fixes the problem it finds.

First Aid will call in the specialist

If you don't need a complete physical, First Aid's Specialists lets you zero in on a specific problem.

Ask the Adviser

Need to figure out why your printer streaks or your mouse sticks?Ask the First Aid Adviser. Just click on a problem and First Aid uses its advanced knowledge base and even the Internet to get your answers.

First Aid Prevents Windows problems

With First Aid's Windows Guardian you get continuous protection from crashes, software lock-ups, failing hard drives and more. It even lets you recover from PC disasters.

Provides Emergency Care and Recovery

First Aid lets you add new games or sound cards without risks, creates an Emergency 'tart-Up' disk and makes a backup of your work. It even lets you recover from PC disasters.

Features	First Aid®	First Aid® Deluxe
Protects against crashes & freezes, and fixes them	✓	✓
Checks over 10,000 software programs for configuration	✓	✓
Fixes internet access, multimedia, and performance problems	✓	✓
Fixes glitches caused by newly installed hardware and software	✓	✓
Lets you recover from PC disasters	✓	✓
One button PC Physical checks every vital component of your PC	✓	✓
Finds tips and advice on the Internet for up-to-the-minute solutions	✓	✓
Updates itself automatically via the Internet	✓	✓
Fixes hard drive problems and makes a backup of your work	✓	✓
EarthLink® Internet Access software with Netscape Navigator™	✓	✓
The Official Tech Support Yellow Pages™ book		✓
Learn Windows 95 CD EasyTutor CRT Multimedia™		✓
Get Connected – Internet CD EasyTuytor™ CRT Multimedia™		✓

Key Features

- Amazingly simple to use
- Fixes tens of thousands of problems automatically
- Prevents PC problems
- Searches the internet to find your answers
- Updates itself automatically

just point and click on where it "hurts" and First Aid will use it's knowledge base and thousands of web sites to interactively guide you the answer

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CyberMedia®

First Aid 97 Deluxe

If you've ever had a PC crash or failure before, you won't want to repeat the experience. You can lose hours of work, cause permanent damage to your system, and worse. But it happens, and when it does, you have a choice. you can call your computer dealer, ring up a techie friend, or consult the manual .... Or you can give your PC First Aid . this unique Windows tool can help prevent crashes, keep your software and drivers up to date , increase available disk space and help re-boot a lifeless PC. It sits quietly on your system, and you'll hardly know to it's there. But when something starts to go wrong, First Aid fires into action to prevent and solve your problems automatically in 3 easy steps. All you do is click the 'Autofix' window and you can even save work in progress before the crash.

First Aid 97 Deluxe
STOCK CODE: RMG201
$79.95

RMG202 First Aid for 3.1x **$64.95**

First Aid 97
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Oil Change

Update your software automatically over the Internet

New software updates and hardware drives are being released on the Internet every day, designed to fix bugs, improve performance and add great new features to your PC. And most of them are FREE! You can keep your PC running smoothly if only you could get these updates, but how do you make sure you have installed the updates properly?

How does it work?

1) Oil Change identifies all the installed softwaree applications and hardware drives on your PC
2) Oil Change then checks with CyberMedia's master list of new updates and drivers that are currently available on the Internet and gives you helpful description of each update so you'll Know what benfit each update will provide
3) You then select only the upodates you want. Oil Change downloads and safely installs your new software automatically

It's Easy and Risk Free

Oil Change saves a backup of everything it changes so you can always undo your last update. One click and your PC's original set-up is restored.

Here"s what Top PC mechanics are saying:

"Could be the most significant program to hit your hard disk in many a moon"
– Netguide

"The most advanced on-line tune up"
– CNET Television

"(with this) digital oil change.... you have not just software but living software"
– Chiptalk KNX Radio

"Oil Change ensures your computer is running the newest software... it doesn't get any easier than that."
– Time Magazine

Saves a backup of all changes so you can always undo any unwanted updates

STOCK CODE: RMG210

$65

New UnInstaller 4.5 for Windows

Safer, faster, better!

UnInstaller 4.5 is the only completely safe way to delete applications and files from your Windows PC. It is the world's top-selling Windows clean-up utility and new Version 4.5 is faster, safer and crammed full with great new features that will make UnInstaller your essential personal PC housekeeper.

No matter how large your hard disk is, it's never large enough. Applications, Internet downloads, graphics and multi-media games fill up a hard disk in no time. When you need more space, clearing off the old, unneeded stuff can be risky. With many applications using hidden and shared files, it's difficult and dangerous to delete files by hand. UnInstaller is the safest way to remove files and applications - *even the things that were on your hard drive before your installed UnInstaller!* Its exclusive SmartLinks technology scans your entire system and identifies all the relationships between programs and files so that UnInstaller can then decide which files are safe to remove and which ones you need. It will never remove an essential Windows system file! With Automatic Backup you have an extra safety net in case you delete something you wanted to keep. With over 1 million users, nothing is safer than UnInstaller.

LOOK! - Hot New Features...

- **Quick Cleanup** - Tell the Quick Cleanup wizard how much space you need. It searches your system and automatically deletes files that can be safely removed - like temp files and Internet cache files.
- **Application Cleanup** - Delete an unneeded application and its related files, Archive an application to another place on your computer with all its related files intact, or Transport an application to a different computer without the need for reinstallation.
- **File Cleanup** - Find all those unnecessary files that accumulate on your system every day. Regular cleanup makes the most of your disk space.
- **Built-in Viewer Pane** - See the contents of files before you delete them without launching any other applications.
- **Graphical Reports** - Display or printed detailed reports to see how your system has changed.
- **Automatic Installation Monitor** - Automatically starts the the Installation Monitor when an application is installed.

WIN.95 ONLY
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WHAT THE PRESS ARE SAYING

"This software will pay for itself over and over again."– *PC Direct*
"The most well endowed of these utilities by some distance."– *Windows User*
"Head and shoulders above most other similar products on the market."– *PC Direct*
"Of the three programmes tested, only UnInstaller 3 did not offer to remove any critical Windows files." – *PC Magazine*

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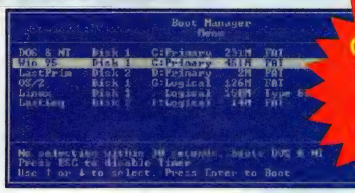
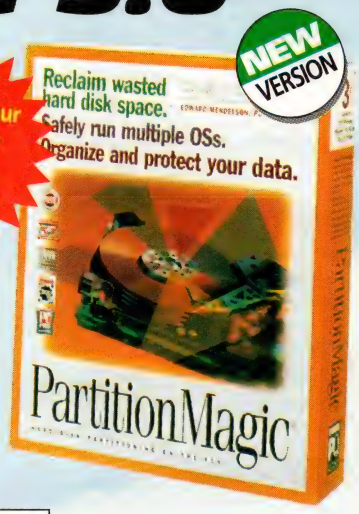
Reclaim up to 40% of your hard disk & organise your hard drive!



PRESTO! Optimise your hard drive without destroying data

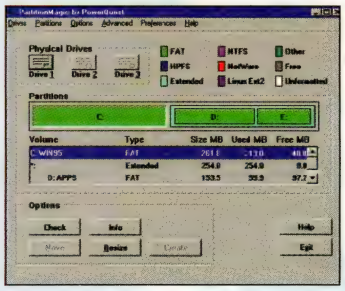


Reclaim Wasted Disk Space

Everyone wants to get the most they can out of their hard disk. But, up to 40 percent of your hard disk may be totally wasted due to inefficient storage methods. PartitionMagic 3.0 increases your usable disk space by shrinking large FAT partitions and restructuring cluster sizes to reclaim up to hundreds of megabytes of lost disk space.

Safely Run Multiple OS's

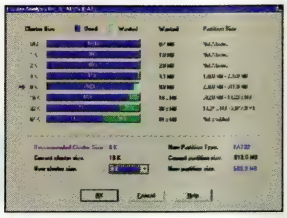
PartitionMagic 3.0 makes it easy to run multiple operating systems on the same machine without compatibility problems. Explore the new world of Windows 95 or NT while still relying on the security of your current operating system. And PartitionMagic 3.0 includes Boot Manager from IBM, making it easy to select an operating system every time you boot your computer.



Create, resize and delete partitions with the drag of a mouse.

Organise and Protect Data

Create a physically separate partition for your valuable data files to protect them from potentially unstable applications. This simplifies backups, especially to devices like ZIP™ drives. And with the transport feature of Uninstaller™, PartitionMagic 3.0 lets you easily move applications from one partition to another with their files and operating system settings in place.



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WHAT THE PRESS ARE SAYING

"Unique, dazzling and indispensable, PartitionMagic is a must have product in an era of larger and larger hard disks"
PC Magazine

PartitionMagic HARD-DISK PARTITIONING ON THE FLY

POWER PQ QUEST

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DriveCopy

NEW PRODUCT

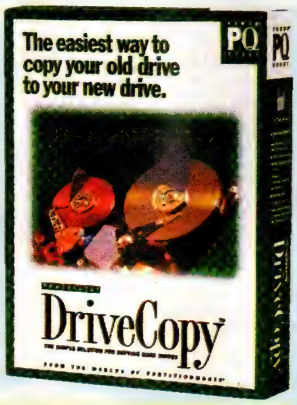
No re-installing, no data loss, no headaches.

The safest and easiest way to copy everything from your old drive to your new drive.

Remember when upgrading to a new hard drive was a painful, risky process? Well, fortunately now there's DriveCopy. With a few simple steps, everything from your old hard drive is automatically copied to you new drive without losing a single preference, setting, or byte of data.

DriveCopy supports all versions of today's popular operating systems and the file system they use.

- Windows 95
- Windows.x
- Windows NT
- Dos
- OS/2



Features:

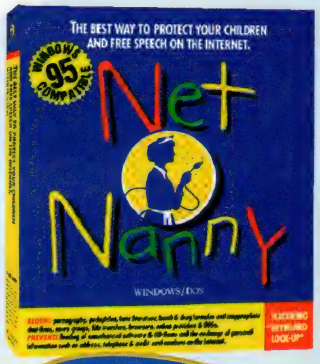
- Copies multiple partitions and expands them proportionally on your new disk
- Features a simple user interface
- Uses proven, reliable technology from the world's leading disk-partitioning software - PartitionMagic

CHK001 DriveCopy **$42**

Net Nanny

NEW PRODUCT

The best way to protect your children on the Internet.



Protect your children against hate literature, pornography, pedophiles, bomb, and drug formulas and any other information or persons you determine are inappropriate on the Internet.

Net Nanny operates in the background without your children knowing and all you have to do is tell her what "Words", "Phrases", "Sties" or contents you do not want entered or received on you terminal.

You can also program Net Nanny to prevent your address, phone number, credit card number from being given out over the Internet along with any other sensitive information you may wish to protect. Net Nanny will also prevent the loading of unauthorized software and CD-Roms and provides protection against accidental deletion or altering of existing information.

Protect Your Children

Access to all Net Nanny Functions is through a special Administration program that allows you to customize settings and review Audit Trails of violations, shutdown dates and times.

CHK002 Net Nanny **$42**

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Vet AntiVirus

Automatic Virus Protection For All Platforms

Essential Protection

Virus protection has never been as essential as it is today. New viruses are continuing to appear at an ever-increasing rate and new types of viruses - for instance, Word macro viruses - regularly take the PC World by surprise.

The Internet, intranets, networks, Email, shared disks and shared PCs all enable viruses to spread.

Virus Protection for Your Sysem

VET Anti-Virus Software provides you with the protection you need for your system, whether it is a stand-alone PC or a complex network of PCís in an organisation. (Server-based virus protection is also available - please ask for information.)

VET Workstation protection provides automatic virus protection and removal: it gives your PC a quick once-over each time it is switched on or rebooted; it checks all files as you try to access them, preventing you from using an infected file or disk; it provides automatic detection against thousands of viruses and is able to effectively clean files infected by all of the common viruses.

VET is a tried and tested product, used on hundreds of thousands of PCís in more then 30 countries. It is installed in many universities, government departments, corporate companies, small businesses and home usersí PCs. VET is regularly evaluated by independent organisations and continues to rate in the top ten worldwide.

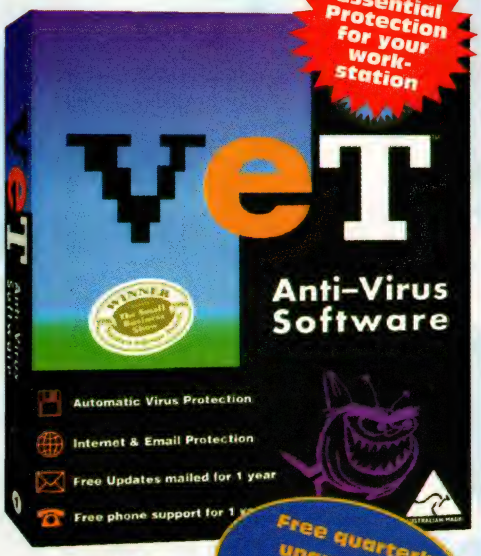
VET Workstation Protection

To make things easy, the VET Worksation box contains versions for Windows NT Worksation, Windows 95, Windows 3.x and DOS complete with manuals for each operating system. VET is more than a product - it is a service as well. All registered users receive free quarterly upgrades for the duration of their licence and free unlimited phone support for the same period.

FEATURES

- Automatic Virus Protection
- Total Macro Virus Solution
- Network Compatible
- Internet and Email Protection
- Update and Support Services
- An Essential Product

VET 002 VET 2 USER LICENCE PACK.....$ 159
VET 003 VET 5 USER LICENCE PACK.....$ 269



Essential Protection for your work-station

Free quarterly upgrades for twelve months. + Free support

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AUSTRALIAN MADE

STOCK CODE: VET001

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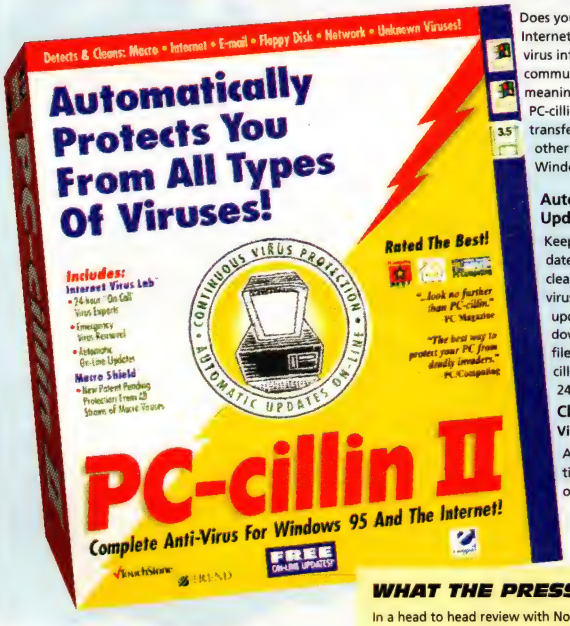
The Top Antivirus Package!

Every major magazine that has reviewed PC-cillin has rated it the UK's top virus software for Windows 95, 3.1 and the Internet. It is the most effective virus protection you can get - don't download without it!



Does your old anti-virus package still protect you? Probably not. New threats from networks, Internet e-mail and shared folders are overlooked by existing anti-virus utilities, which assume that virus infections only originate from infected floppy disks. Windows 95's sophisticated communication and multi-tasking capabilities have created a virtual breeding ground for viruses - meaning that you need powerful, continuous protection.

PC-cillin II is the only software that can keep you fully covered. It scans all the Internet file transfers, checks incoming e-mail attached files, and scans more types of compressed files than any other package. PC-cillin II is the only anti-virus package that has what it takes to guard your Windows system.

Designed for Microsoft Windows 95

Automatic, On-line Patern Updates -

Keeping the virus pattern file up-to-dateis the key to detecting and cleaning many odf the newest viruses. Now PC-cillin II does this updating for you–automatically–by downloading the latest virus pattern files as they becomne available. PC-cillin keeps your prottection current 24 hours a day!

Clean Wizard- Your Built-in Virus Expert.

Automatic virus removal! Every time PC-cillin nabs a virus, our one-of-a-kind Clean Wizard instantly springs into action to automatically remove ythe virus for you step-by-step, without harming your valuable data. It's the virus expert – so you don't have to be

Macro Shield - The only True Macro Virus Defence!

NewWord Macro Viruses are being created at a blinding pace. Not only are they extrememly difficult to catch before they cause damage, but they can be produced in a matter of minutes by practically anyone! PC-cillinII blocks Word Macro viruses before they have a chancre to infect your system. Plus, our patent-pending MacroShield not only detects and cleans known macro viruses, but will even catch new strains that have not been identified yet.

Macro Shield - The only True Macro Virus Defence!

thousands of viruses are lurking throughout the Internet and online services, just waiting tojump through any unprotected modem or Internet connection. But have no fear PC-cillinII stpops them cold.

WHAT THE PRESS SAY

In a head to head review with Norton AntiVirus and McAfee Viruscan PC Computing magazine called PC-cillin "the best way to protect your PC from deadly invaders."

STOCK CODE: RMG047

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FREE! unlimited virus updates online for 1 year!

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RESCUE

What would you do if you lost all your data...right now?

Data recovery for every Windows 95, Windows, and DOS user.

Rescue Data Recovery Software gives you added peace of mind and handles the greatest concerns of all PC users; drive crashes and data loss! Through its automated procedures and patented "smart" recovery technology, RESCUE helps you to recover one of your most precious possessions; your computer stored information, graphics and data.

Be Prepared...

When disaster strikes reach for RESCUE, the best selling data recovery software for Windows and DOS users. RESCUE is so simple to use. By just pressing a few keys, or with a click of a mouse, anyone can start recovering their own data in a matter of minutes. There's absolutely no technical expertise required!

Your Insurance Against Data Loss

Because back-ups don't always work and often aren't made, they alone are not a guarantee that your data is secure. Nothing can stop your hard drive from crashing when its time is due, but RESCUE, like an insurance policy, gives you the peace of mind and the security of knowing your data is safe and available when you need it. Having RESCUE gives you the additional protection your data requires.

RESCUE Gets Your Data Back, Fast

Other recovery programs require that you first fix the damage caused by a crash before there's even a chance for any data to be recovered. That's often very hard to do. Time consuming and even runs the risk of further data loss.

With RESCUE's patented recovery technology you'll automatically and safely bypass the crash to quickly retrieve your valuable data.

Prevent Lost Time, Lost Work

Recreating your lost work from scratch can take a long time, and can be frustrating and costly. Imagine sitting at your PC and trying to remember work that was completed weeks before and then having to re-enter it into your computer, a gruesome task at best!

Instead of agonising for countless hours in front of your computer, let RESCUE do the work for you and recover all your Windows and DOS files including: word processing, spreadsheets, databases, graphics, games, deleted or erased files and even data from compressed drives.

Easy to use:

RESCUE is the most advanced, yet simplest to operate, data recovery software in the market today. It is the first true do-it-yourself data recovery software available.Unlike other recovery utilities that require advanced computer and software understanding, RESCUE operates independantly and automatically, executing the recovery actions necessary to retrieve data from crashed hard drives and floppies.

STOCK CODE: NIT003

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"In the past general failure messages left you few options. Norton, Central Point or Mace Utilities weren't likely to help.... Now there is a better solution ... RESCUE can recover data from all but the most thoroughly trashed disk... RESCUE works miracles..."

Infoworld

"RESCUE is a real life saver"

Mobile Office Magazine

"RESCUE goes further and recovers data even if it is corrupted or if the disk is physically damaged by holes or scratches"

Personal Computer Magazine

"If you're familiar with the message "error reading drive,Abort, Retry, Fail?" then you know that sinking feeling> RESCUE can now render that message meaningless!"

CFO Magazine

NEW Features...

- Fully automatic data recovery for hard drives and floppies
- Works on compressed drives
- Works on deleted files
- Fast, easy, safe

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ReachOut - Remote Access

Reach Any PC, From Everywhere, Everyway

Away from your office, but need remote access to files, data, or application from your PC? It's easy with the award winning ReachOut 7.0 from Stac. ReachOut is the only all-in-one box solution to provide remote access from, and to virtually any PC running Windows NT, Windows 95, Windows 3.1, or DOS.

For after hours workers, business travelers, telecommuters, home office workers, mobile executives, road warriors, and held desk personnel. Access all files, applications, and databases. Ideal for sending and retrieving important files, editing documents, updating spreadsheets, chatting, or helping remote users.

From everywhere you want to be, Stac's ReachOut 7 provides secure remote access to all files, applications, and databases back on your office PC, your network, or any PC you are designated to access.

Don't have ReachOut with you? No problem! Simply log onto the Internet, use a leading browser to download a ReachOut Passport Plug-in or ActiveX, and within seconds you'll be directly controlling your office PC.

Fast Secure Remote Access

Numerous, award winning security features assure exceptional password, callback, IntruderGard lockout, encryption, and virus checking procedures. ReachOut also offers automatic installation, connection wizards and scripts, and simple drag and drop file transfer.

ReachOut is so fast that using it is just like sitting in front of your desktop and with ReachOut Passport you can remotely access your Internet connected PC using popular web browsers with lighting speed. There's no need to even take ReachOut with you.

ReachOut is a proven winner - outdistancing all other brands in "Choice", "Best", "Recommended", and "First" awards from major computer publications.

Best of all ReachOut is easy to set up and use.

Stac®
www.stac.com

STOCK CODE: STC002

$249

ZetaFax 5.0

Fax Software for PC Networks

The most advanced fax software for your PC Network

Zetafax, the first fax server for Windows NT to enter the Australian market now combines fax and e-mail to provide a complete communications solution.

Great for integration with existing corporate systems, Zetafax 5 supports ODBC (Open Database Connectivity) compliant databases from Microsoft, Sybase and Oracle. Users can access existing corporate databases for fax addressing, without the need to import database information into the fax serverr's address book.

Now sold in over 25 countries, this is the world's favourite LAN fax software for Windows NT. Zetafax is both scalable and adaptable. It supports Windows 4.0, as well as Windows 95, Windows 3.1, 3.11 and Windows NT 3.51. It runs on Windows NT Server, Novell NetWare, and just about every other PC network. The e-mail gateway option integrates with Microsoft Exchange, Microsoft Mail, Lotus CC:Mail, Lotus Notes and GroupWise.

NEW PRODUCT

FEATURES

- Send & receive faxes directly from your workstation
- Use existing address books for faxing
- Send faxes from any windows application
- Support inbound routing & broadcasting faxing
- Scalable from 5 to 1000 user networks
- Add additional fax lines or users when
- Fax easily as printing
- A Microsoft recommended fax solution

Stock Code EQU016

$799

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EQU007 Zetafax 10 user license	$1099
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The Fastest Way to Share All Your CD-ROMs Over a Network

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Stac

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Stac's CD-Quickshare Network Edition is a fully proven software-only solution that gives all your networked and remote Windows users fast, simultaneous access to shared CDs. CD-Quickshare stores compressed CD images on your server's available disk space, which essentially transforms any file server into a powerful CD-ROM server in just minutes

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Designed for Microsoft Windows 95

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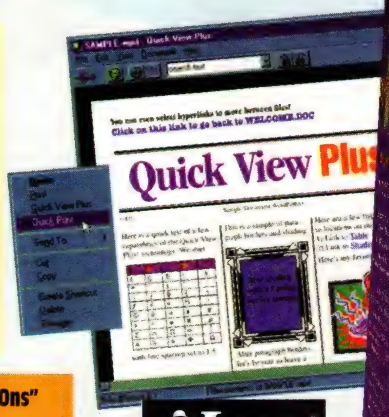
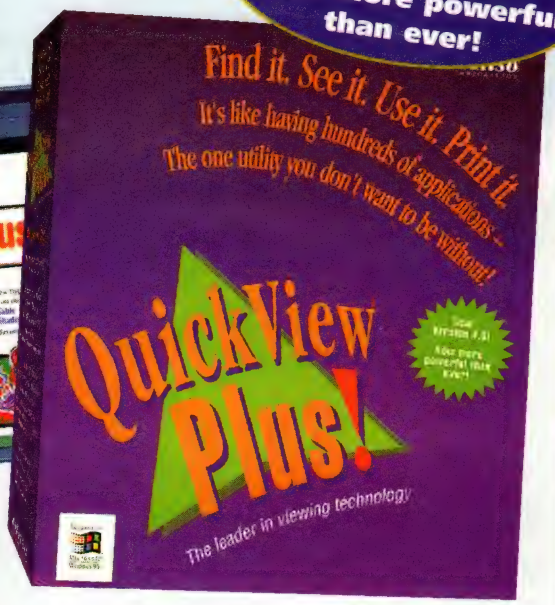
New Version 4.0 Now More powerful than ever!

The Unbelievably Useful Utility for Windows 95/Windows NT
See, copy and print virtually any file - with all formatting intact - even if you have none of the originating applications! Quick View Plus is the essential utility for every Windows user!
Not only does Quick View Plus seamlessly integrate into Windows Explorer and Microsoft Exchange, it also operates within Netscape Navigator as a plug-in and within Microsoft Internet Explorer as an ActiveX Document viewer.

Features;

- Launch native applications
- The fastest way to print any file
- Seamlessly integrates into Windows 95, including Microsoft Exchange.
- Instantly see E-mail
- Identifies the type of file being displayed even if the extension is incorrect.
- Includes powerful text search features
- Supports page level attributes, like columns, headers/footers, page numbers and footnotes.
- Supports hyperlinked documents, so you can instantly look at related files
- Supports over 200 Internet formats - word processing, graphics, spreadsheet, database, presentation and compressed-including HTML, PKZIP and UUE.





"Make this your First Choice for Windows 95 Add-Ons"
Window sources Magazine.
"..an essential tool!"
PC Magazine.

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INS015 Quick View Plus **$89**

ZipMagic

The Next Generation Zip Program

Immediately know what's inside a Zip File - and use zip files without having to unzip them first!

Hot New Product

ZipMagix includes the patent-pending ZipFolders technology, which safely and transparently turns zip files into Window folders. The contents of zip files you download, receive or create become instantly accessible, so you can view and modify files, run programs, archive files, all with spectacular ease - without having to unzip anything. And every file stays compressed in the zip file, saving precious disk space!

Features

- Standard UnZip/Zip functionality
- Use Zip files without unzipping them
- Run any program within a Zip file
- Repair damaged Zip files
- Convert other formats to Zip
- Updates itself over the Internet
- Fully integrated file viewing
- Modify Zip contents at will
- Create sub-folders in Zips

ZipMagic fully supports the universal ZIP format, as well as other compressed files like ARJ, LHA/LZH, GZIP, TAR, TAZ, TGZ, CAB and ZOO.

Opens all compressed files, even email attachments! You can also open and decode email attachments like BinHex, UUEncode, XXEncode and MIME.

STOCK CODE: ZIP016

ZipMagic includes an Archive Manager.
Only ZipMagic has the revolutionary Internet EasyUpdate, which seamlessly updates your copy of ZipMagic to the latest maintenance release.

$55

AUS132 Zip Folders **$39**

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Accelerate Your Hard Drive By Up To 500%

With Windrenalin experience a rush as your hard drive accelerates by up to 500%. Instantly your heart rate accelerates, your respiration skyrockets as your program launch speed improves out of sight. In theory, with transfer rates upwards of 5MB per second, your hard drive is very fast. In reality, it often struggles to go faster than 1/10th that speed. Just like an expensive 260 kph sports car that rarely goes over 100 kph your hard drive is often obstructed by the PC equivalent of stop signs. Traffic jams and speed limits.
WINDRENALIN with its award-winning patented SuperFast technology reduces these obstructions. Instantly accelerate your hard drive. Launch programs faster. Multi-task faster and speed up file system operations on high-end Pentium PCs

"Adrenalin for Windows"

One look at the control panel confirms the fact that this is a new kind of software

Features

- Launch Programs Faster
- Multi-task Faster
- Speed Up File system Operations
- Instantly Accelerate Your Hard Drive

AUS313 Windrenalin **$79**

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THUNDERBYTE-Anti Virus

How good is your virus protection?

ThunderBYTE provides two very special features. Firstly it uses heuristics to detect viruses that it does not know about. Secondly, you need to keep up to date and this will often cost you hundreds of dollars per update - not with ThunderBYTE, updates are provided FREE via the Internet. So don't be fooled by cheaper alternatives that charge you less up-front but get you later.

Stay one step ahead of computer viruses

The minds that dream up viruses are ceaselessly attempting to develop new methods of breaking through existing security. To guarantee sufficient protection, most producers of anti-virus software issue quarterly or half-yearly subscriptions for updates. ThunderBYTE's tools and techniques have rendered this approach obsolete. Thanks to their revolutionary heuristic analyses and generic decryption techniques, the ThunderBYTE anti virus utilities are always one step ahead of the virus writing community.

Ahead of the Competition

The ThunderBYTE development team is always one step ahead of the competition when it comes to new detection techniques and tackling new dangerous viruses, like the new macro virus family. ThunderBYTE is one of the few scanners able to understand the OLE2 format of Microsoft software like MSWord, MSEcxel. This means full detection capability of Macroviruses, even encrypted ones! The ThunderBYTE development team has even developed a revolutionary macrocleaning utility, which enables all users to quickly and effectively remove all macroviruses.

Tested

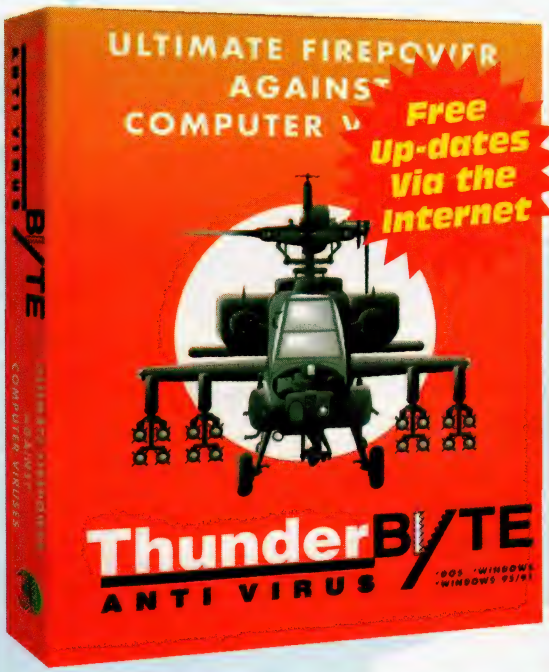
Tests all over the world prove: ThunderBYTE Anti Virus Utilities is the fastest and most innovative anti virus software available!

Windows 95/97, Windows 3.1x and DOS compatible

AMIR - Advanced Macrovirus Identification and Removal Technology

AMIR forms an indispensable asset for the effective detection of the increasing number of macroviruses. ThunderBYTE is the first to implement the new AMIR technology in its virus control products. The AMIR technology enables super fast detection, unique identification and removal of newly discovered macroviruses.

NT VERSION NOW AVAILABLE



Features

- Features Scans and removes known and unknown file, bootsector, polymorphic and encrypted (macro) viruses.
- Fastest scanning speed in the world!
- Detects known and unknown (macro) viruses
- Incorporates five different virus detection routines: signature, CRC, heuristics, Generic decryption and active monitoring
- Automatic and transparent operation
- Frequent ThunderBYTE updates
- Full technical in-house support
- Available for DOS, Windows 3.x, Windows 95, Windows NT and OS/2

- ***Not "just another scanner"***
  ... An essential anti-virus utility toolkit providing reliable protection, detection and disinfection!
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  ... Include unique heuristic and decryption engines to detect event new and unknown viruses!
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  ... Set protection levels to suit your own needs!
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  ... Free from the Internet and support bulletin boards!

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Online services and the Internet have become vital business tools. Now, there is an easy, affordable solution to dedicating a phoneline and modem for each user- with INSYNC ®ModemShare™. Features Include:

- Total interoperability between Wins 95,Win 3.x and DOS.
- Works with the latest 32bit communication applications.
- Connects to COM port for direct access to a mainframe.
- Re-directs COM ports to shared modems under Win 3.x and Win 95
- Allows global views of available resources and their status on the network

3.5

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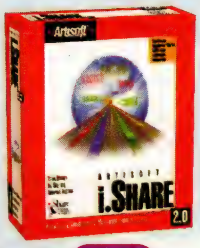
Artisoft i.Share v2.0



i.Share 2.0 is the way to save money..

..While giving everyone on your network access to the Internet. i.Share provides simultaneous Internet access for every Windows 95, 3.11 or NT 3.51 client on your network from a single, secure access point on a Windows 95 server, now you only need:

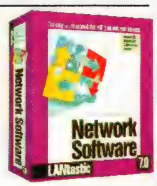
One Internet account, one phone line connection, one IP address and one TCP/IP stack (server only).

No need to have a separate ISP and phone connection for each user, cuts administration expenses, and reduces memory usage on each PC requiring Internet access. Additional features include Eudora™ Light e-mail client software; Tierra Highlights™ Internet monitoring and alert software; NetCentric™ FaxStorm™ software for cheaper faxing over the Internet; Forte FreeAgent news reader; and Kali™ Internet gaming software.

3.5

ART048 Artisoft i. Share v2.5 for MS/LAN/Netware $259

LANtastic V7



The first Internet-ready network for small businesses

LANtastic version 7.0, upgrades the award-winning LANtastic network operating system with more speed, memory handling, expanded communications and new Internet/WAN connectivity features. LANtastic combines these newly enhanced capabilities with ease-of-use and industry-low prices that have made LANtastic the leader in small-business networking.

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E-mail that makes your business look bigger, run smarter and faster!

Power up your communications with Artisoft's XtraMail, the low-cost , full-featured, easy to use e-mail solution. Now you can exchange messages fast, whether it's the next room or across the world. Use the Internet's globe-spanning reach to stay in touch with employees, customers and far away important contacts. Designed and priced for small businesses and branch offices, it still has the robustness and scalability to meet the demands of growing businesses.

Low cost full-featured e-mail solution

ART044 Artisoft XtraMail for Windows 95 ..... $325

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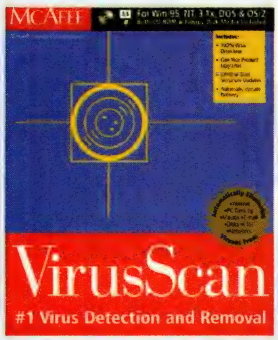
McAfee Viruscan



No.1 in virus detection & removal!

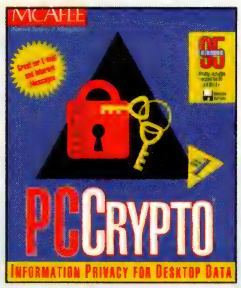
Every month, over 200 new viruses damage data and productivity. These viruses are unintentionally received through disks, bulletin boards, on-line services, e-mail, the Internet and organisational networks. Why have millions chosen McAfee VirusScan for their security? Superior virus detection, removal and support services. VirusScan natively supports a variety of desktops with features to keep your system immune from these viruses.

VirusScan scans all system areas to provide extensive security including local and network drives, CD-ROMs, floppies, boot sectors, file allocation and partition tables, folders, files and compression files. It accurately cleans most virus infections from files, master boot sectors, partition tables and memory.

MCAFEE Network Security & Management

MCA034 VirusScan 3.0/95/NT - CD..... $79

McAfee PCCrypto



Keep hackers out of secure personal information in files, clipboards and e-mail.

Theft of laptop PCs has increased by 39% - 208,000 were reported stolen in 1995 (mostly at airport X-ray security points). The data within can be far more valuable than the units themselves. PCCrypto™ allows users to easily secure documents, spreadsheets, graphics, and other data on desktops and laptops from hackers and information brokers. PCCrypto keeps unwanted viewers out, even if your system is unfortunately lost at an airport.

MCAFEE Network Security & Management

MCA026 McAfee PCCrypto..... $69

MCA029 McAfee PCCrypto..... $49

Remote Desktop 32

Remote control of Windows 95 and NT workstations

NEW PRODUCT

Remote Desktop/32 offers a high-performance 32-bit solution for viewing and controlling remote Windows NT and Windows 95 systems running on Intel, Mips, and DEC Alpha systems.

The product is a fully multi-threaded 32-bit application which allows viewing, controlling, and communicating with remote systems over networks and telephone lines. Remote Desktop 32 utilises the operating system services of Windows NT and Windows 95 such as security, RAS (Remote Access Server), and network protocols.

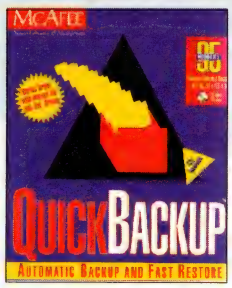
MCAFEE Network Security & Management

Remote Desktop/32 ships as a 2-node pack which gives you two way remote control licensing.

MCA028 McAfeeRemoteDesktop32 ..... $129

QuickBackUp

The easiest and fastest backup and restore software for Windows 95 and NT users.



If you want your most critical files stored in a safe location where you could easily retrieve them either from a local or network disk or from the Internet at any time, then you need QuickBackUp™.

Point and Click Backup:

Easy, flexible backup, restore and file management protection. Automatically and transparently backup your most important files to a SCSI tape drive, and Iomega ZIP/JAZ drive, the Internet or rewritable CD. Backup unchanged files on-access or close of a document.

Features

- IFS Tape (Installable File System)
- Automated Configuration wizard
- Internet account option

MCA030 McAfee Quick BackUp V2.0 for Win 95 ..... $79

All prices INCLUDE sales tax. Prices subject to change, see page 3 for terms & conditions.

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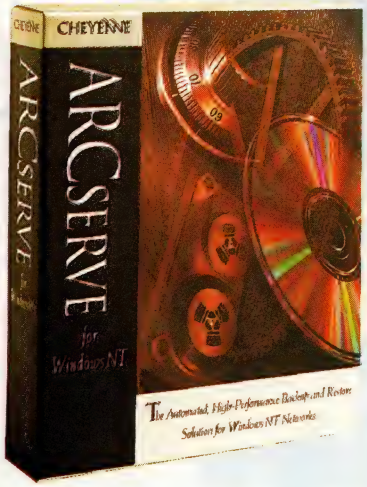
CHEYENNE ARCserve 6



ARCserve 6 delivers unsurpassed data integrity by combining award-winning features of the ARCserve product line, with the industry's most advanced data recovery technology. Large and small business alike can benefit from ARCserve's superb ability to seamlessly manage data faster and easier than ever. With record-breaking processing speeds, ARCserve 6 can reduce your backup widow dramatically. Have security knowing that the data on your heterogeneous environment is protected.

ARCserve 6 supports not only DOS, OS/2 and Windows workstation, but also has optional modules for UNIX, Macintosh, Windows NT, Windows 95 workstation and your on-line databases.

Ease of Use: - With its improved Windows 95-like interface and the new Job Status Wizard, ARCserve makes backing up your data easier than ever.

Manageability:- Centralized job management and status viewing allows administrators to quickly access necessary information and to efficiently manage all backup and restore operations.

Integration:- ARCserve 6 is fully NDS-compliant and NetWare certified, making is a completely integrated NetWare 4.x application. With just one log-in and one view, administrators have access to all servers and resources on the network. ARCserve 6 allows you to browse NDS trees and choose entire containers or individual objects for backup and restore.

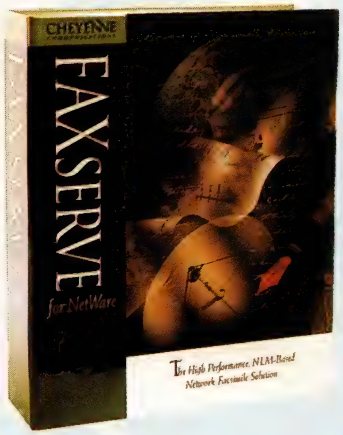
Performance:- Add the benefits of distributed processing your backup/restore scheme with ARCserve's Pus Agents. These remote server programs perform all of the file-reading processing, while streaming data across the network to the ACRserve server. This dramatically increases the speed of the remote backup and reduces the overhead on the host server and eliminates repetitive handshaking.

Reliability:- ARCserve provides an automated utility for quick restoration of downed servers. By taking a snapshot of the current server environment and synchronizing it to the backup media, ARCserve can automatically rebuild your server from a single tape and disk - with a minimal NetWare installation.

CHE040 **ARCserve 6 10 users or less.....$449**

CHE041 **ARCserve 6 (workgroup) 25 or less.....$797**

CHEYENNE FAXserve



The Award-winning FAXserve is a high performance, NLM-based facsimile solution, designed to integrate seamlessly with Novell NetWare operating systems. FAXserve's easy-to-use Windows interface simplifies faxing for end users and network administrators. Users send and receive faxes directly from their workstations, store faxes in electronic files and share fax hardware with other users on the network. Network administrators can take advantage of FAXserve's centralized administration, scalability, and high performance.

User Benefits

Numerous functions are just a mouse click away with the award-winning FAXserve interface! Send faxes with ease from Windows, DOS, and E-Mail applications. FAXserve features include optional cover pages, automatic redial, automatic notification of inbound and outbound transmission status, and automatic inbound fax routing. Electronic phone books with Quick Dial and Fax Broadcasting features expedite and simplify fax addressing. Send faxes to individuals or groups.

Administrators Benefits

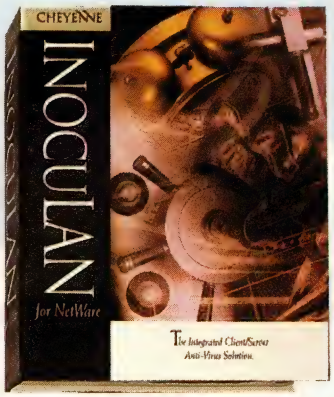
Network Administrators will benefit from FAXserve's NetWare Directory Service support, SNMP Manager support, Windows installation, pre-run configuration check utility, and centralized administration.

Flexible Configuration

FAXserve supports two server configurations. The first is the Host/Run-time configuration and the second is the single server configuration. With Host/Run, all NLMs and communications hardware run on one server, the Run-time server, while users are logged onto a main server, the Host server. This dedicates more processing power to faxing and leaves the host server free to handle other services.

CHE011 **FaxServe 5 users .....$579** CHE010 **FaxServe 10 users.....$1109** CHE008 **FaxServe 25 users $1799**

CHEYENNE InocuLAN For Windows NT or NetWare



InocuLAN is the leading anti-virus solution for Windows NT or NetWare 3.x and 4.x servers, offering unmatched enterprise management and virus protection. Exclusive features of InocuLAN include Real-Time Cure, Universal Manager, Virus Wall, Virus Quarantine, Hands-Free Updates, Extensive Alerting options, Support for Windows NT and virus protection for Internet downloads and e-mail attachments.

InocuLAN is certified by the NCSA to detect 100% of viruses in the wild, carries the "Designed for BackOffice" logo from Microsoft and has won the Editor\155s Choice from Windows NT magazine in both 1995 and 1996. Ideal for Windows NT (Intel, Alpha, PowerPC, MIPS) and NetWare enterprises, InocuLAN is fully integrated with separate Cheyenne Anti-Virus clients for Windows NT, Windows 95, Windows 3.x, DOS and Macintosh Workstations.

Features:
- NCSA Certification
- Scheduled Scanning with
- Alert Systems
- Windows Interface
- File Server Stratification Utilization Gauge
- Real-time Monitor
- Domain Support
- Flexible Reporting
- Enforcement
- Windows, DOS and Mac Client Support

CHE042 **InocuLAN (Netware).....$499** CHE043 **InocuLAN (NT).....$999**

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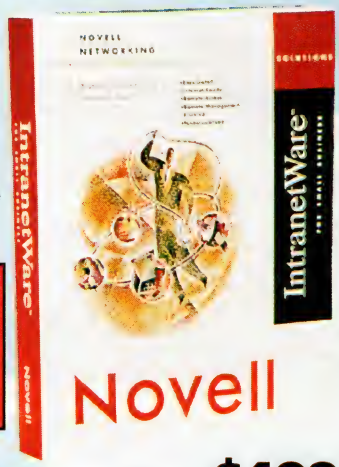
IntranetWare for Novell® Small Business

If you own or manage a small business, you want a network platform designed to meet your needs - not a one-size-fits all solution.

IntranetWare combines Novell's leading networking foundation with its new standards-based intranet services to create a powerful platform for deploying private corporate intranets and connecting to the global public Internet.
IntranetWare provides both IP and IPX access to intranet resources, including Web servers, FTP servers, Internet WAN connections and more. IntranetWare leverages the capabilities of the superior file and print, security, management and directory services provided by NetWare 4, opening it into a scalable full service business intranet. IntranetWare preserves NetWare customers' existing network investment while allowing them to embrace Internet technology and the benefits of today's full-service intranets.

- Minimise Hardware Expenditures – IntranetWare for Small Business and NetWare Connect also let you save money because your staff can share modems and phone lines to dial out and connect to the Internet.
- Simple Installation, Easy Administration – IntranetWare for Small Business can be installed in less than 30 minutes.
- Pay As you Grow – You want the network technology you need when you need it. With nodal licensing, you can add additional employees to the network as your business grows.
- Help Is Never Far Away – With IntranetWare for Small Business, forget about sifting through manuals. You get answers in no time on-line. On-screen, graphical help includes full-text documentation with Full-text search capabilities using the industry's most powerful tools. What's more, you connect to the Internet .

Receive a FREE Windows CE hand held PC from Casio, valued at $995, when you buy over $2000 of IntranetWare for small business + server



Features

- Is the scalable, full-service intranet platform businesses need.
- Is built on Novell's premier networking foundation – NetWare.
- Provides the industry's best file, print, security, management and directory services.
- Combines Novell's leading networking foundation with its new intranet services.
- Is the most reliable, secure, and powerful platform for deploying private corporate intranets.
- Gives customers the technology they need to seamlessly connect to the public nternet.
- Gives customers protocol independence with access to intranet resources from both IP and IPX networks.
- Includes integrated Web server, browser and intranet development tools.
- Enables customers to preserve their existing network investment.

NOV302 IntranetWare for Small Business - 5 User + Server **$499**

NOV303 IntranetWare for Small Business - 10 User + Server **$699**

Additional Licenses

NOV300 IntranetWare for Small Business - 1 User **$79**

NOV301 IntranetWare for Small Business - 5 User **$379**

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APC UPS's

Why do you need power protection? An uninterrupted power supply keeps your equipment safe from power events including surge, swells, brownouts and blackouts – and keeps you safe from downtime that power problems invariably produce.

Back-UPS Pro

- Performance protection for advanced workstations
- Automatic Voltage Retulation
- Multistage surge protection
- Plug and play with Win'95
- User Replaceable, Hot swappable
- Line-interactive Design
- Communication Interface Port

Smart UPS

- Performance Power management for advanced business networks
- SmartBooster and SmartTrim
- Nine Wave output
- Available in Rackmount and Extended Run modules
- SNMP Support Available
- Intelligent Battery Management

All have 2-year warranty

Product Code	Description	Price
Back-UPS Pro Plug and Play	**See below for Powerchute plus operating system**	
APC001	Back-UPS Pro 280 Pnp	$309
APC002	Back-UPS Pro 420 Pnp	$449
APC003	Back-UPS Pro 650 Pnp	$519
Smart-UPS and Powerchute Plus		
APC004	Smart-UPS 450 with Powerchute plus	$669
APC005	Smart-UPS 700 with Powerchute plus	$719
APC006	Smart-UPS 1000 with Powerchute plus	$1129
APC007	Smart-UPS 1400 with Powerchute plus	$1488
APC008	Smart-UPS 2200 with Powerchute plus	$2309
APC009	Smart-UPS 3000 with Powerchute plus	$3249
Surge Protection		
APC010	ProtectNet for telephone and Modem lines	$35

Essential hardware protection

SmartUPS ships with Powerchute plus for NT, Powerchute plus for Netware, Powerchute Plus for Windows, PowerNet SNMP Agent for Netware,HP NetServer Assistant Support(NT and NetWare), Microsoft SMS Support, Compaq Insight Manager (NT and NetWare) Lotus Notes Shutdown Support, DMI Support, Netfinity Support, PowerNetSNMP Agent for NT & SCO UNIX
Back UPS Pro ship with Powerchute Pro PnP for Windows 95, Windows for Workgroups and Windows

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HP SureStore CD-Writer

6020i/6020es/6020ep

Make your own CDs!

- **Organize, distribute and archive your files**
- **Ideal for multimedia**
- **Store up to 650 Megabytes of data or 74 minutes of audio**

HEWLETT-PACKARD SureStore INFORMATION STORAGE

With millions of CD-ROM readers worldwide, recordable CD is the ideal way to store and distribute powerful, effective and impressive multi-media presentations. And since CD-R is such a low-cost removable media, it's perfect for moving and archiving files.

It's easy to make your own CDs. HP SureStore CD-Writer is the simplest way to make CDs. The CD-Writer solution includes SCSI-2 cable, a blank HP SureStore recordable CD and a comprehensive software suite.

Alchemy Personal is text-based file retrieval that lets you build databases of images and documents that can be searched and displayed in under three seconds. Great for archiving.

Easy-CD Pro lets you copy data or audio files to CD from Windows File Manager.

Overall, HP SureStore CD-Writer combines affordability, performance, reliability and support.

Package includes:
- HP SureStore CD-Writer External CD-R drive
- Sofware CD, driver installation diskette and manuals
- One blank SureStore recordable CD
- Parallel port external data interface cable
- Audio connector cable
- External power supply.

Designed for Microsoft Windows 95

Features:
- Easily connects to PC's parallel port interface
- Simplicity in making your own CDs
- Portable - share between PC's, laptops or locations
- Meets industry standards
- Performance - 2X recording speed allows you to write 100MB in approximately five minutes
- Multi-session compatible
- Capacity - 650 MB data or 74 minutes audio
- Durable media - Up to 100 year shelf life
- Hewlett-Packard Customer Support via BBS, Website or Telephone
- Includes one year limited product warranty.

HWP155	HP 6020i (Int)	$729
HWP156	HP 6020es (Ext SCSI)	$879
HWP157	HP 6020ep (Ext parrallel)	$879
LNX001	Writable CD (5 pack)	$45

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The most up to date technical reference manual available

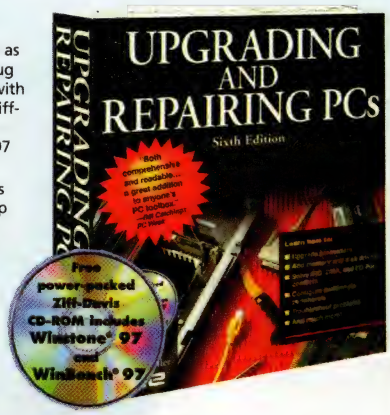
No Matter What Kind Of PC You Have, This Book Has The Upgrading and Repairing Answers You Need!

Far more than just a "repair" manual, Upgrading and Repairing PCs, Sixth Edition is simply the most comprehensive PC support reference available. Discover the best way to access your system, install hardware, and troubleshoot problems. Learn about the latest state-of-the-art motherboards, processors, memory, and disk drives.

This book addresses all PC-compatible systems, from notebooks to towers, as well as Windows 95 and the new Plug and Play standard.Included with this invaluable reference is Ziff-Davis benchmarking and diagnostic tools - Winstone 97 and WinBench 97.

Completely test your system's performance with today's top software products. Compare relative system performance before you purchase a computer.Measure the difference made by the system tuning and optimizing techniques shown in the book.

Fully test each of your computer's subsystems and eliminate performance bottlenecks.



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Designed for game enthusiasts, Righteous 3D accelerates all 3D features simultaneously without compromising real-time interactivity, making good games great and great games truly awesome.

Plug and Play Operation

Plug and play compatibility with Microsoft Windows95 features automatic configuration and trouble-free operation.

True Arcade quality graphics in real time

WARNING RUNNING PC GAMES ON **RIGHTEOUS 3D** ACCELERATOR MAY RESULT IN A MASSIVE ADRENALINE RUSH

JAT001	Righteous 3D	$369

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AI Gotcha
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Take snapshots of your favorite images from Camcorder, VCR, or other Video source in 16.7 million colours into your PC. You can use photos for multimedia presentations, web page publishing, disk-based catalogues personal photo albums, image database, digital greeting cards, newsletters, e-mails and much more. This is a simple plug-in and play device providing a high quality portable capture solution. By connecting to a video source, whether composite or Y/C, an extremely high quality image can be captured (1600 x 1200 dpi) into any of the supported graphic file formats.

The package includes

- AiGottcha! Hardware
- AiGotcha! Real-time image capture software
- All necessary cables
- User's manual
- Video Craft Multi-Media suite of special effects

ASS004 **AI Gotcha** **$329**

Pocket Scan Converter (PSC 1106)
Put your business presentations on the big screen.

Using the Pocket Scan Converter in conjunction with your notebook computer (or PC), any presentation can be displayed on a TV or recorded onto video tape, making the Pocket Scan Converter ideal for business, education and training applications. This compact device simply plug into your notebook/PC and the other end into a TV/Video to put your presentations onto the big screen. And when the work is done,play computer games on your TV. Designed with flicker reduction circuitry and S-VSH support, the Pocket Scan Converter produces extremely vivid, high quality images with up to 16.8 million colours.

ASS001 **PSC 1106** **$229**

WaveWatcher TV PCI Card

Video capture (to 30 f.a.s.) and TV tuner PCI card with remote control

This professional Video capture and TV tuner PCI adaptor provides resolution up 768x560 at 30 fps or single frame, and display mode up to 1280x1024 in 24 bit true colour
This simple to use Plug-n-play installation makes getting started a snap. The WaveWatcher PCI provides superior performance for PCI bus, eliminating the need for feature connector as well as the VGA looping cable.

A MultiMedia Studio on Your Computer
Capture full motion video direct from your TV, camcorder of VCR with CD-quality sound. Includes Media Studio Pro 2.5 professional editing and special effects software. MS 2.5 allows the creation of professional full motion multi-media clips with up to 101 simulataneous video and audio tracks.

125 Channel TV Turner
Featuring 125 Channel TV Turner with Background viewing. Simply plug your television antenna input directly into your computer and watch your favourite shows and movie on UHF or VHF while running other applications.

Video Conference Enabled
Works with your video camera, modem and video conferencing software for improved image resolution and faster frame rates. Includes Unled's MediaStudio 2.5 Video Editing Software

ASS006 **WaveWatcher (PCI Card only)** **$359**

Video Conferencing U/G Kit

Ideal add-on for the Wavewatcher TV PCI.or any other video conferencing capable system. The package includes an elegant camera (320 TV lines, auto pan focusing, auto balance and more) high resolution composite video camera, stereo microphone, and VDO phone conferencing software.

ASS003 **WaveWatcher Video Conferencing Kit** **$345**

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SOUND Mate™

Take your old Notebook out of the prehistoric era.

The SoundMate is specifically designed to bring old Notebooks into the multimedia age. This completely portable multimedia system includes a 12x CD-ROM and a 16 bit sound card all encased in a small lightweight multimedia unit.

Make your move into multimedia easily and simply as there are no messy cards to install, it simply connects to the parallel port of any Notebook or Desktop computer,

The SoundMate is fully Windows, DOS and Win95 compatible and comes complete with high quality amplified speakers, headphone set, carry case and all connector cables and driver software.

Also included is a FREE software package consisting of Asymetric Web Publisher and Trispective 3D Eye Drawing programs, allowing you to create WEB pages up to any magnitude.

FREE Software Titles valued at $548

Package includes:

- Simple plugs into Parallel port
- Suits any Notebook or Desktop Computer
- Latest 12x CD-ROM Drive
- Amplified High Quality Stereo Speakers (Voted best speakers 1997)
- 16 Bit Stereo Sound
- Talking software warehouse Quality Carrycase

UTC002 **Sound Mate** **$599**

Idiot Proof Multi-Media EASY Mate

– Just plug in and play.

- External 12x Speed High Performance CD- ROM
- Front Loading motorised tray, no caddy required
- High speed reading transfer rate (sustained) 1800KB/second using a high speed parallel port
- High speed access random average:110ms
- Supports High Sierra, ISO 9660, CD-ROM XA, Photo CD & CD-Audio formats
- MSCDEX compatible includes MSCDEX

Bonus Asymetrical Software

Includes EasyMate Case, 12x CD-ROM & all Cables & Drivers.
With bonus Asymetrical Software - Web Publisher & Tri-Spectives 2D Eye

UTC001 **Easy Mate** **$399**

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Sound Blaster AWE64 Value

From the highly acclaimed AWE series comes the Sound Blaster AWE64! The latest addition to the award winning Sound Blaster family offers the best combination of PC audio hardware and software for musicians, power gamers, multimedia enthusiasts and Internet wizards. Make your favourits come alive with incredible audio realism. Experience smooth, expressive and realistic true instrument reproductions, as well as amazing sound effects with the renowned EMU8000 WavEffects™ synthesizer and Creative WaveSynth/WG. In addition, enjoy advanced audio technologies that include E-mu 3D Positional Audio and SoundFonts, an exciting array of INTERNETed. A slew of high quality, useful audio software and utilities for all your multimedia needs.

Create and enjoy professional quality 64-voice Wave-Table and WaveGuide music with digital effects. Edit and create life-like SoundFont instrument and sound effects that rival recording studios.

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- Professional Sound Editing Software Bundled
- Surf and Communicate with Sound Blaster INTERNETed Audio
- 100% Sound Blaster, Sound Blaster 16 and Sound Blaster AWE32 Compatible

Creative WebPhone
No more long distance toll charges. Real-time, full-duplex voice communication over the internet. Includes a voice mail system, caller ID, and call/mute/block. Provides one phone line with unlimited talk time.

Microsoft Internet Explorer v3.0
Surf the web with this full-featured browser. Fully integrated with RealAudio Player support. Compatible with all major Internet standards and supports current security standards.

RealAudio Player v3.0
Unlock the potential of the Internet with RealAudio Player for 'live' and on-demand audio. Listen to news, entertainment and speeches from around the world.

Creative Multimedia Deck
Control playback of multimedia audio types: MIDI music, .WAV files and CD Audio. Establish playlists and control volume, bass & treble through an on-screen remote control.

Creative WaveStudio
A full-featured .WAV file editing program that is powerful and easy to use. Record and edit digital audio files. Record .WAV files that can then be converted into SoundFonts.

Creative Soundo'le
Record and play digital audio files and embed them into applications that support Object Linking and Embedding (OLE). Record from multiple sources and select from a variety of compression formats to minimize disk space. Great for annotating spreadsheets, documents and e-mail.

Vienna SoundFont Studio
A professional editor that allows you to create or modify SoundFonts which can be downloaded onto the AWE64's onboard memory. Change pitch, add reverb, chorus, delay, vibrato and more to create unique sound effects.

Designed for Microsoft Windows 95

CRE030 SoundBlaster AWE64 Value **$185**

Video Blaster Multimedia Internet Toolkit (VBIE500) Creative Compact Video Conferencing CCD Camera

The Video Blaster™ Multimedia Internet Toolkit has the tools to expand your Internet experience and guide you to amazing multimedia production with simple-to-follow directions.

Here's what it has to offer:

Creative's Video WebPhone - Combine with Creative's CCD Camera to see and talk to your Internet friends, family, or business associates in any part of the world at local rates! Easy-to-follow steps to your own web page creation. Fun applications to produce and edit your own video clips. This kit even lets you put together lively albums that last forever ... and all this is just the beginning!

With Video Blaster Multimedia Internet tookit you'll have endless fun on the Internet, become your own home film maker, create multimedia family albums for future generations to cherish... the possibilities are simply endless. And so's the fun in doing it all! Explore, create ...surprise yourself with the unlimited things you can produce with this amazing one-stop toolkit!

Designed for Microsoft Windows 95

- Make Long-Distance Video Phone Calls on the Internet at Local Rates
- Create Everlasting Family Albums with Pictures, Video Footage, Text and Sound
- Produce and Edit Your Own Video and Add Special Effects for Stunning Results
- Easily Design Your Own Web Page and Be Part of the Net

CRE031 Sound Blaster CD MM upgrade **$279**

CRE036 Creative Compact Video Conferencing CCD Camera **$185**

Sound Blaster Home CD 16/16X Multimedia Upgrade Kit

The complete multimedia package perfect for the whole family. Work and play with the Sound Blaster CD Home, stocked with 9 best selling Microsoft titles, Sound Blaster 16 audio and the iNFRA 2400 16X CD-ROM drive, the first with remote control convenience!

Designed for Microsoft Windows 95

CRE032 Sound Blaster Home CD Upgrade Kit **$469**

Sound Blaster Value CD 16/16X Multimedia Upgrade Kit

Blaster your way into the multimedia age with the Best Entry Level Kit. Upgrading your PC has never been easier with Sound Blaster CD Value - featuring Sound Blaster 16 Plug & Play audio card, Creative iNFRA 2400 high performance 16X CD-Rom drive and great software titles at an affordable price.

Designed for Microsoft Windows 95

CRE033 Sound Blaster Value CD Upgrade Kit **$379**

Netwave MX Combo Modem

Future-proof your Internet access with Netwave MX, the affordable 33.6kbps - ISDN solution. It's the smart internal modem card that grows with your needs and your business. The flexible DSP chipset firmware means that you can upgrade the 33.6kbps voice-fax-modem to the emergent 56kbps standard without spending a cent or step straight up to 128kbps ISDN, all using the one board. Plus use DSVD to talk, exchange files and share applications on the one call.

CRE034 NetWave MX combo Modem **$259**

Smart TV

Watch TV or Video simultaneously while waiting for your programs to download. With just a click of a button, SmartTV allows you to switch from running or loading your programs to watching TV and vice versa. Stay tuned - even with the PC off, you can use Smart TV even when the PC is powered down.

- Enjoy TV programs even when the PC is off
- No system limitations
- Plug and Play installation
- Suports worldwide Video standards
- Full function remote control

CRE035 Smart TV **$229**

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Are you missing quality sound from your PC?

J-902R (J902+J340)

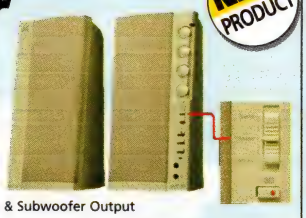
Peak Music Power Output: 300W
Peak Music Power Output: 128WDriver: 4"Woofer Cone
Driver:One 3°± Full Range Cone
Frequency Response: 35Hz-250Hz
Frequency Response: 100Hz-15Hz
Controls: Power, ON/OFF, Volume, Bass
Input: 3.5mm Phone Jack
DC Input Jack
Indicator: Power Led
Input: RCA Jack
Indicator: Power Led

WOW005 Jazz Hipster J-902R.....**$159**

JS JAZZ J-300 Hipster

NEW PRODUCT

P.M.P.O. 300W
Two 3" full range driver
One 1" tweeter
3D controls Music, Theater & Games.
Bass, Treble, Balance, Volume, Mute & 3D on/off Controls
Headphone, Microphone & Subwoofer Output



WOW001 Jazz Hipster J-300.....**$99**

JS JAZZ J-100

100W 3" Full Range Driver

P.M.P.O. 100W
One 3" full range driver
3D controls
On/OffBass, Treble, Balance, Volume, Mute & 3D on/off Controls
Headphone, Microphone & Subwoofer Output

WOW003 Jazz Hipster J-100.....**$69**

JS JAZZ J-200

P.M.P.O.200W

One 3" full range driver
One 1" tweeter
3D controls Music, Theater & Games
Bass, Treble, Balance, Volume, Mute & 3D on/offControls
Headphone, Microphone & Subwoofer Output

WOW002 Jazz Hipster J-200.....**$89**

J-900

Quality 4" Woofer Cone

Peak Music Power Output:

300WDriver: 4"Woofer Cone
Frequency Response: 35Hz-250Hz
Controls: Power, ON/OFF, Volume
nput: 3.5mm Phone Jack
DC Input Jack
Indicator: Power Led

WOW004 Jazz Hipster J-900.....**$119**

JS JAZZ S-123

NEW PRODUCT

Directivity:Unidirectional
Output impedance: 2K 0hms
High Sensitivityz-70dB KHz
(0 dB-1V/microbar
Wide Frequency Response: 100 Hz-11KHz
Low Current Consumption: Max 0.5ma
High S/N Ration
Internet Phone Ready
Voice Recognition Approved

WOW006 Jazz Hipster S-123 .....**$15**

Compro

Compro Super Pack

Includes 7 Fantastic New Titles

With this pack, you have your choice of a fast Compro 12X or 24X CD-ROM drive plus Sound Card and a pair of Compro Stereo Speakers.

For even greater value the 1997 Best '7" pack and 7 new fantastic CD titles have also been included.

3D/EYE TriSpectives 1.0
TriSpectives is a complete 3D-drawing program for Windows 95. With over 1,000 professionally designed 3D Intellishape models, you can use TriSpective to create amazing 3D animation, illustrations and drawings.

Asymetrix Digital Video Producer 4.0
Asymetrix Digital Video Producer 4.0 is the easiest tool available to assemble digital movies and edit video and audio clips on your desktop PC

Asymetrix 3D F/X 2.0
3D F/X is graphics and animation software that allows Windows 3.1/95/NT users to create high impact professional-quality rendered images and animation.

Compel 2.0
Interactive presentations made easy. Work with text, graphics, animation, sound and video to create stunning interactive presentations.

Web 3D
Web 3D is the easy way to put incredible 3D images and design elements into your home pages. Compelling graphics and up-to-date information are keys to getting new and repeat visits to your home page.

Web Publisher
Choose from 20 different completed sets of professionally created theme templates, which include banners, buttons, backgrounds and other Java powered graphic elements.

Encyclopedia Of Their Sacrifice
Their Sacrifice CD ROM captures the sounds, sights, thoughts and lives of Australians both at home and at war during World War II. The CD contains over 400 photos and images and 30 minutes of original film, and 90 minutes of recordings.

CMP001 Compro Super Pack (12x CD ROM Drive).....**$299**

CMP002 Compro Super Pack (24x CD ROM Drive).....**$349**

The 1997 Best '7' Pack includes: Grolier 1997, Mega Race 2, Master clips 10,000, Chess Master 4,000 Turbo, Mavis Beacon Teaches Typing, US Atlas, and World Atlas.

ASYMETRIX

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Traxdata - CD Recorder/Player Kits

Everything you need for CD recording in a single box!

CDs provide the most cost effective and safe medium for long term storage and now with CD Recorders, they are the first-choice solution for Data Distribution, Archiving, Computer Backup and Audio Recording.

The Traxwriter CD Recorder kits provide both the business and home user with the very latest in CD Recording in a convenient all in one solution. These kits are suitable for Windows 3.11, 95, NT & OS2, and reflects the very latest technology available. With a selection of read/write speed combinations and a range of internal and stand-alone mountings, Traxwriter has a recorder kit to suit every need.

The difference in speed only effects how fast the device can record. Typically the CDR2600 range will record 150MB in 7 minutes whereas the CDR4600 range will take just 4 minutes.

Traxwriter kits provide users with everything needed to set up for CD recording in a single box.

All Platforms Compliant

Traxwriter CDR2600
2x Recorder 6x Playback
recorder kit includes:
- Traxdata CDR2600 drive
- WinOnCD ToGo Software
- Advansys 5140 SCSI Card
- 2 x Traxdata CD's
- Prosca Pen
- Cabling

Traxwriter CDR4600
4x Recorder 6x Playback
recorder kit includes:
- Yamaha CDR4600 drive
- WinOnCD ToGo Software
- Advansys 5140 SCSI Card
- 2 x Traxdata CD's
- Prosca Pen
- Cabling

TRX100 Traxwriter CDR 2600 ..... **$729**

TRX102 Traxwriter CDR 4600 ..... **$1299**

Scratch and win one of 10 luxury holidays to Barbados when you buy TraxData Gold CD ReusableMedia. Thousands of other prizes to be won, ends 31 August 1997.

Consumables and Storage

Code		Price
TRX 104	External Case and SCSI Cable (upgrade for Traxwriter to and external unit)	$219
TRX 103	Traxdata 74min CD Recordable Media with Datagard Protection (Gold/Gold)	$9.50
TRX 105	Mitsubishi 74min Platinum CD Recordable Media with Coating (Silver/Blue)	$9.00
TRX 135	Mitsubishi 650MB Rewritable CD Jewel Case	$49
TRX 107	White Labels for PressIT Labeller (pack of 50)	$25
TRX 108	Red Labels for PressIT Labeller (pack of 50)	$25
TRX 109	Yellow Labels for PressIT Labeller (pack of 50)	$25
TRX 110	Blue Labels for PressIT Labeller (pack of 50)	$25
TRX 111	Gold Labels for PressIT Labeller (pack of 50)	$35
TRX 112	Silver Labels for PressIT Labeller (pack of 50)	$35
TRX 113	Clear Inkjet Labels for PressIT Labeller (pack of 50)	$49
TRX 114	Clear Laser Labels for PressIT Labeller (pack of 50)	$49
TRX 115	Flipdisc CD Storage Box (Capacity 12)	$25
TRX 116	Flipdisc CD Storage Box (Capacity 16 + 1 CD Rom Drive)	$45
TRX 117	Flipdisc CD Storage Box (Capacity 24)	$35
TRX 118	Mitsubishi 230MB 3.5" Unformatted MO Cartridge	$25
TRX 119	Mitsubishi 640MB 3.5" Unformatted MO Cartridge	$59
TRX 120	Mitsubishi 650MB" 5.25" 1024 Bytes Per Sector MO Cartridge	$69
TRX 121	Mitsubishi 1.2GB 5.25" 512 Bytes Per Sector MO Cartridge	$89
TRX 122	Mitsubishi 1.3GB 5.25" 1024 Bytes Per Sector MO Ca rtridge	$89
TRX 123	Mitsubishi 2.3GB 5.25" 512 Bytes Per Sector MO Cartridge	$129
TRX 124	Mitsubishi 2.6GB 5.25" 1024 Bytes Per Sector MO Cartridge	$129
TRX 125	Mitsubishi 650MB CD Rewritable Cartridge	$59
TRX 126	Mitsubishi 4mm 90m DAT Tape	$15
TRX 127	Mitsubishi 4mm 120m DAT Tap	$29
TRX 128	Mitsubishi 8mm 112m DAT Tap	$15
TRX 129	Mitsubishi 8mm 160 DAT Tap	$24
TRX 131	Mitsubishi IBM Formatted 3.5" Black Diskettes individually wrapped (box 10)	$9.99
TRX 130	Mitsubishi IBM Formatted 3.5" Color Diskettes individually wrapped (box 10)	$10.50
TRX 132	Mitsubishi IBM Formatted 3.5" Black Diskettes in Library Case (box 10)	$9.99
TRX 133	Mitsubishi IBM Formatted 3.5" Color Diskettes in Library Case (box 10)	$9.99
TRX 134	Mitsubishi Super High Grade Printer Paper (pack of 100)	$15

PressIT Custom CD Labeller

Give your CDs a professional image.

Custom Lable your CDs

The PressIT CD Labeling Kit uses a clever yet simple design, allowing you to put professional looking labels on your CDs. This neat and compact labeling system provides the perfect answer to all those CD labeling task which, up to now, have been a real problem. The PressIT uses special die-cut labels (available in a range of colours as well as clear plastic), which can be printed using either an inkjet or laser printer.

PressIT's unique system positions and applies the labels perfectly centered and bubble free every time.

Included in the package are 20 assorted labels and Design Express software that makes creative design straight-forward, together with templates for most MAC and PC based graphic packages including:

For Macs: MSWord, Photoshop, QuarkXPress, Illustrator, Freehand, Pagemaker, Claris Works.

For PCs: CorelDraw!, Photoshop, QuarkXPress, Illustrator, Freehand, Pagemaker, MSWord

TRX106 PressIT **$79**

Choose a Free CD with every order!

1. **MasterClips 1000** — A collection of professional colour clipart
2. **Starfish Internet Utilities** — Manage your diary, contacts, meetings and communications via the Internet
3. **Bodyworks V3** — Learn all about the human body with multi-media guide.
4. **TurboCAD V1 Windows** — The most significant release of any CAD software this decade
5. **EZ Language Version 1** — EZ Language V1 is the fun & easy vocabulary learning tutor for 7 different languages
6. **Leonardo the Inventor** — A multimedia exploration of the life works of Leonardo da Vinci. (No 3D glasses)

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EVERYTHING FOR YOUR PC - DELIVERED NATIONWIDE!

miroVIDEO DC 30

Professional studio quality nonlinear digital video and audio editing system.

miro

Whether you are creating industrial videos, commercial videos, corporate presentations or training tapes, building footage for multi mudia CD-ROMs, 3D animation, wedding videos, or just want to capture and edit your vacation videos, nonlinear editing makes it easy for you to be creative and tell your story in the most effective way possible. miroVIDEO DC30 is the ideal system.

FEATURES

- PCI bus mastering technology
- Video data rates up to 6 Mb/Sec
- Studio quality resolution720 x 480 (NTSC) and 768 x 576 (pal) pixels
- Adjustable compression up to max 3:1
- Integrated CD-quality audio for perfect lip synchronisation
- Video overlay for real-time monitoring on your PC Display
- Supports all standards:NTSC, PAL, SECAM, CCIR 601
- Input and output for S-VHS, Hi8, VHS and Video8
- Professional video editing software with hardware supported acceleration

LAK110 Miro Video DC30 ..... **$1789**

MediaStudio Pro 5.0

MediaStudio Pro 5.0 Today's most complete and powerful desktop video editing solution.

Ulead Systems

You've shot the video, rendered the animation and created cutting-edge imagery.
It's time to assemble your best video production yet. To make sure your hard work gets the treatment is deserves, turn to MediaStudio Pro 5.0, the tool professionals use to get the job done. With MediaStudio Pro 5.0 you can now produce full-screen, high-quality video right on your desktop with new rendering and previewing technology which is twice the speed of the previous version.

FEATURES

- New rendering and previewing technology
- superior sub-pixel rendering
- Precision device control colour calibration and extensive keyframe support
- Tightly integrated, video specific programs
- New video painting and titling programs provide boundless creative freedom
- Plus many, many, other features

LAK111 MediaStudio Pro5..... **$679**

miroVIDEO DC 10

Easy-to-use personal desktop video editing system for high-quality home videos.

Want to edit your birthday, vacation or wedding video or create your own multimedia clip?
The miroVIDEO DC10 is the easy solution to produce your personal videos .
miro's fast, plug and play installation and easy-to-use software will have you producing high quality video in minutes. miroVIDEO DC10 even analyses your system and automatically configures itself to provide the best video quality on your system.

miro

FEATURES

- Complete video editing system for windows
- Digital video recording directly to the pc,s hard disk
- Add transitions, titles, and special effects to your video
- supports S-VHS , Hi8 and VHS camcorders and VCRs
- Output your video to a TV or VCR

LAK101 Miro Video DC10 ..... **$639**

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VideoDirector Studio 200

Turn your raw video footage into perfectly edited productions.

NEW PRODUCT

Editing your video use to be a juggling act - trying to fast-forward to just the scenes you want to copy.

Choose the best, edit the rest!
Just play your video through the VideoDirector Studio mixer and it automatically detects and marks the beginning and end of each new scene. Then grabs the first frame of every scene and remembers where it is on the tape. To edit, just drag and drop your favourite scenes in the order you want. It couldn't be easier!

Tell the story with titles and transitions.
Once you have selected your scenes and put them in sequence, you can add true, professional-quality transitions - choose form over 100 Wipes, Fades, and Dissolves! Or add coloured, transparent, or drop-shadow titles.

Now here this.. A professional sound track
Next, record some narration for your video, add music, and even sound effects. VideoDirector Studio 200's audio features give you control of the soundtrack of your personal production.

As easy to use as your camcorder!
When you have finished with your production, just click on "Make Tape." VideoDirector remembers the location of every scene on your source tape and then automatically finds and record each shot and effect your have selected. In minutes, you will have all the highlights to your video on one exciting tape.

Easy to install - Start editing in minutes!
Setting up VideoDirector Studio 200 to work with your PC is easy! Just attach it to your computer's parallel port, connect your camcorder and VCR using standard cables, and you are ready to go. Best of all, you don't have to open up you computer and VideoDirector does not fill your hard drive with huge video capture files.

Grab high-resolution video frames in a snap!
Video Director Studio 200 captures still frames from your videos, too. Just pick any image your camcorder can see and grab an instant digital "Snapshot". You can add it to any PC document, or even edit it back into your next video production.

BEST OF 1997 RetailVision
NEWMEDIA MAGAZINE THUMBS UP
VIDEO camera AWARDS
VideoDirector 200
Windows EXPERTS' CHOICE
Videomaker BEST OF THE YEAR
the BEST of EVERYTHING ★★★★★ Computer Life

Package Includes

- VideoDirector 200 Mixer: (Connects to your PC's parallel port. Includes S-video and composit video inputs/outputs and printer pass through.)
- Smart Cable (Controls your camcorder and VCR)
- VideoDirector 3.0 software
- Title Editor 3.0 software
- Audio Editor software
- CD-ROM of Clip Media

Stock Code NIT004

$599

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STORAGE

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QIC EXTRA

Innovating in data storage media technology

One cartridge fits all QIC-80, QIC-Wide and Travan™ drives. Delivers over 25% higher capacity thanTravan™ equivalent. Higher capacities than all othewr media, keeps the costs per MByte to a minimum. Fully pre-formatted & approved by QIC and all drive manucfacturers.

VER024 DC2120 EXTRA 400/800MB $49.95
VER045 TR1-EXTRA 500MB/1GB $55
VER044 MC3020 EXTRA 1.6/3.2GB $60
VER046 TR-3 EXTRA 2.2/4.4GB $65

Verbatim

DAT 4mm

VER067 DL90M 1.3GB Tape Cartridge $15
VER068 DL120M 4GB Tape Cartridge $32

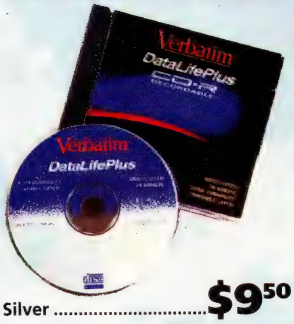
DAT 8mm

VER056 DL112M 2.3GB Tape Cartridge $16
VER069 DL160M 7GB Tape Cartridge $29

Verbatim

CD Recordable Optical Disks

The ideal solution for desktop online archiving



Verbatim

VER043 CD DataLifePlus 640 MB CD Silver $9.50

Verbatim HD Disks

Each Verbatim diskette is individually certified 100% error free. All are pre-formatted to save ypu time. A typical datalife diskette will perform an average of 30 million revolutions– almost ten times the industry standard. A highly developed burnishing process makes for perfect cintact between your floppy drives read head and the floppy., no wonder Microsoft use Verbatim disks exclusively for their products! Ten disks are included in one pack.

Verbatim

VER001 Verbatim 3.5 HD IBM disks (10 per pack) $10.95
VER002 Verbatim 3.5 HD Apple disks (10 per pack) $10.95

Sony StorStation

Ultra-Compact Ultra-Fast Ultra-Easy

The Sony StorStation Tape Drive, with a capacity for up to 2.0GB, it's a great way to backup your hard drive.

The StorStation is easy to install, taking only minutes and connects to the parallel port for convenience. It is also small, light and very portable.
The StorStation lets you protect the contents of your hard drive just by clicking an icon. You can also schedule backups, so even if you forget, the StorStation does not. You can also perform Backup in the background. This function lets you continue to use your computer, as your hard drive is being protected.
Restoring is just as easy with a simple click, as with the copy function from tape-to-disk and disk-to-tape.

SONY

Features
- 2.0GB Capacity (with compression)
- 1.0GB Capacity (uncompressed)
- One-Step Backup
- Easy installation
- Includes powerful backup software
- One QW2GB Data Cartridge

Stock Code: SONY21

$355

Sony QW2GB data cartridges

Sony QW2GB data cartridges, the reliable and versatile solution for data backup. With a maximum of 2GB capacity, it's perfect for the needs of most PC users, and its conformity to international QIC standards ensures compatibility with all other QIC media.

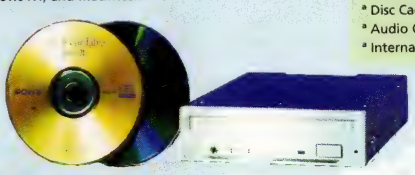
SONY20 Sony QW 2GB data Cartridge (5 pack) $209

Spressa CD-ROM Recorder

Spressa Recordable CD-ROM (CDOR) Drives - 2x Write/4x Read

Create your own CD-ROM discs or back-up/archive with your data with the Sony Spressa, Recordable CD-ROM Drive. With the Spressa, creating CD's is easy, efficient and inexpensive. Whether it's a document, database, image file, multimedia presentation or other information, the Spressa provide users the capacity to retain, distribute and access data.
Bundled with the Spressa is CD Creator Mastering Software, enabling users to enjoy ease of use and powerful functions. The robust features of the CD Creator include Disc Wizard for assisting the disc creation process, a jewel case editor for creating customized inserts, video CD and Photo CD creation capabilities, CD duplication services and studio (WAV) file editing capabilities.
Spressa CD-R drives now support Windows 3.x, Windows 95, Windows NT, and Macintosh

Supplied Accessories:
- One CD-R Disc
- Drive Letter/Number Labels
- Disc Caddy
- Audio Cable
- Internal SCSI Cable



SONY

SONY22 Sony Spressa External $1209
SONY23 Sony Spressa Internal $969

Sony Recordable CD media

Sony CD-R media has a large 650MB recording capacity for digital data: computer, audio and digital video. These Write-once CDs are extremely reliable and ideal for a wide range of applications.

SONY24 Sony CD-R media (10 pack) $109

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- **Nationwide Delivery** — We can deliver to any location in Australia, quickly. Whatever it takes, we deliver.
- **Massive Stocks** — Our aim is to fulfil 95% of orders from stock. Our financial stability enables us to hold more than 10,000 items in stock at any one time.
- **All Welcome!** — We always service the individual buyer, small business and large corporation to the same high standard.
- **No.1 Service** — As an International company we have won more awards for products and services than any software mail-order company.

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EVERYTHING FOR YOUR PC - DELIVERED NATIONWIDE!

ZIP — An affordable personal storage solution in one!

Expand your hard drive without the limits
Increase your storage quickly, easily and economically - as you need it. With 100Mb Zip Disks, you can add as many disks as you need and if you're using compression software, you can keep up to 200MB of your stuff on a single Zip drive.

The newest smallest, most portable drive. The best way to move your information - Zip drive and disks are small, light and convenient. Zip drive weighs about 450g and fits easily in your hand,bag or briefcase.

- **Expand your hard drive without the limits** (100MB at a time)
- **Take it with you** (Zip drive and disks are portable)
- **Backup your hard drive** (fast and easy)

zip 100 parallel port — iomega

IOM022	Zip Drive External (parallel port)	$239
IOM020	Zip Drive External (SCSI port)	$239
AUP157	Zip Drive Internal 3.5 (Includes SCSI Controller Card)	$239
IOM052	Zip Starter Kit	$329

JAZ — Jaz is the perfect choice for hard drive upgrades!

An ideal answer for multimedia
Jaz drives and disks are the ideal solution for storing, transporting and playing multimedia applications. You can pack up to 1 gigabyte on each disk, and there is no limit to the number of disks you can use. The jaz drive's speedy access times and rapid transfer rate mean you can quickly and easily move files around.
And the Jaz drive can handle even the most demanding usages, including full-screen full motion video.

- **Faster than most hard drives** (Works as fast as you do)
- **Provides 1GB of disk space on each compact cartridge** (Enough to back up your entire hard drive)
- **Portable- goes where you go** (makes transporting information easier)

jaz 1GB drive portable scsi — iomega

IOM023	JAZ drive (SCSI External)	$679
IOM021	JAZ drive (SCSI Internal)	$509

ZIP & JAZ

AUP160	3x ZIP 100Mb PC Disks	$79
IOM030	10x ZIP 100Mb PC Disks	$249
AUP161	3x ZIP 100Mb Mac Disks	$199
IOM044	6x ZIP 100Mb CD Disks	$149
IOM032	3x JAZ Media PC Disks	$449
AUP162	3x JAZ Media Mac Disks	$449
AUP163	JAZ Traveller (Transfers data from a Mac to a PC)	$69

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FUJITSU MO Drives/Disks

More reliable and cost effective than magnetic removable storage

- ***Re-writable***
  Magneto Optical, or MO as it is more affectionately known, is like owning a 21 speed, infinitely re-writable CD Rom, with a disk that fits into your top pocket.
- ***More reliable***
  MO has all the benefits of other removable media storage devices but is far more reliable because it's an Optical technology, not magnetic.
- ***ISO standard***
  MO is a genuine ISO standard and has grown from 128MB to the current 640MB, and has a road map to beyond 4GB, so your investment is future proof.
- ***Unaffected by magnetic fields***
  MO is unaffected by magnetic fields (PC speakers, mobile phones), dust, moisture (even a coffee spill can be cleaned off without loss of data), and scratch proof (the optical disk is protected in it's own cover).
- ***Stored for many decades***
  Your data is stored optically on an MO disk, so it will be there for many decades if necessary and only cost around 9 cents per megabyte.

MO Drive 640Mb External (SCSI)

The Professionals Choice

1.9GB (3 Disks) $177

STOCK CODE: AUP300
$779

MO Drive 230Mb External (PCMCIA)

STOCK CODE: AUP306
$697

Comparison Table

	CD/R	Syquest	Zip	Jaz	MO
Rewritable	✗	✓	✓	✓	✓
Drop & Scratch proof	✗	✗	✓	✗	✓
ISO Standard	✓	✗	✗	✗	✓
Archive	✓	✗	✗	✗	✓
High Speed	✗	✓	✗	✓	✓
Cents Per MB	3.3c	47c	26c	14.9c	9.2c

AUP164	MO Drive 640MB Internal 3.5 (SCSI)	$699
AUP165	MO Drive 640MB Internal 3.5 (includes SCSI controller Card)	$797
AUP166	230MB MO Drive Internal (EIDE)	$499
AUP304	230MB MO Disks	$26
AUP305	640MB MO Disks	$59

640MB External Interface Kits Available

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STORAGE

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BACKPACK PARALLEL PORT TECHNOLOGY

They plug straight in to the printer port backpack PARALLEL PORT TECHNOLOGY

$389

NRG100 PD/CD Drive, 4X CD-ROM drive with 650Mb Rewritable PD Optical Drive (Includes 1 PD Cartridge) **$749**

NRG101 PD/CD Drive, 4X CD-ROM drive with 650Mb Rewritable PD Optical Drive & Built-in Sound Card(Includes 1 PD Cartridge) **$1029**

$195

$749

NRG130 Backpack 4X CD-ROM Drive **$389**
NRG134 Backpack 4X CD-ROM Drive with built-in sound card **$479**
NRG103 Backpack 8X CD-ROM Drive **$549**
NRG102 Backpack 8X CD-ROM Drive with built-in sound card **$699**

NRG132 Backpack 800TD Tape Drive (400/800Mb) **$195**

NRG119 Backpack 8000T Travan TR-4 Tape Drive (4/8Gb) (Includes 1 Travan Tape) **$1049**

** All Backpack includes DOS, Windows 95 Drivers.*

INTERNET

$79

NRG105 ***Internet WorldTalk™ Phone***
- Save money on long distance calls
- Actual two-way conversation – ideal for conference calls
- Compatible with all Windows 95 Sound Cards

WEB REMOTE – MAKES WEB SURFING AS EASY AS CHANNEL SURFING!

NRG107 ***web.remote***
- Includes Microsoft Internet Explorer 3.0

$75

NRG106 ***web.remote Professional***
- Wireless IR technology delivers up to a 8m range

$95

LIFETIME KEYBOARDS

NRG109 ***Lifetime Classic***
is the perfect entry-level or basic replacement keyboard for any user. **$69**

NRG110 ***Lifetime Designer***
charcoal black with contour-styling and matching cable. **$95**

NRG111 ***Lifetime TrackBall***
reduces desktop clutter with an ergonomically located trackball below the spacebar. **$135**

NRG112 ***Lifetime TouchPad***
features a touchpad with 500 C.P.I. resolution for extreme accuracy. **$229**

NRG113 ***Lifetime Wireless Classic***
offers the freedom of infrared wireless technology. **$209**

NRG114 ***Lifetime Wireless TrackBall***
gives a new level of freedom and comfort with infrared wireless technology. **$279**

NRG115 ***Lifetime Wireless TouchPad***
joins the most advanced pointing system available with up-to-the-second wireless keyboard technology. **$339**

Guaranteed for a lifetime!

Lifetime Wireless Keyboards use the latest infrared technology with centre-bearing switch technology. There are two operating modes: 0-1 metre for normal computing and 1-15 metres for group presentations. Batteries (included) have a life of approximately 400 hours!

WIRELESS

Choose a Free CD with every order!

1. **MasterCups 1000** — A collection of professional colour clipart
2. **Starfish Internet Utilities** — Manage your diary, contacts, meetings and communications via the Internet.
3. **Bodyworks V3** — Learn all about the human body with multimedia guide
4. **TurboCAD V1 Windows** — The most significant release of any CAD software this decade
5. **EZ Language Version 1** — EZ Language V1 is the fun & easy vocabulary pronunciation tutor for 7 different languages
6. **Leonardo the Inventor** — A multimedia exploration of the life works of Leonardo da Vinci. (No 3D glasses)

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$349

NRG124 Sonica Colour Plus 14"
- Maximum resolution 1024 x 768 non-interlaced
- Refresh Rate 800 x 600, 72Hz

$479

NRG125 Sonica Image Vision 15"
- Maximum resolution 1280 x 1024 non-interlaced
- Refresh Rate 800 x 600, 100Hz 1024 x 768, 75Hz
- Built-in Power Management

$759

NRG126 Sonica SoundVision 17"
- Maximum resolution 1024 x 768 non-interlaced
- Refresh Rate 800 x 600, 72Hz
- Built-in Power Management
- ***Built-in Stereo Speakers***

$969

NRG133 Sonica OnScreenDisplay17"
- Maximum resolution 1280 x 1024 non-interlaced
- Refresh Rate 800 x 600, 100Hz. 1024 x 768, 75Hz
- Built-in Power Management
- Advanced Microprocessor Based Digital Control with OSD Menu

ZYCON JOYRIDER

It's a car, it's a plane, it's a bike... it's a Zycon 3 in 1 Joyrider!

NRG118
- Contains two independent Joysticks
- Includes Bonus CD-Rom with 10 Demo Games

$149

JOYSTICKS

NRG122 PC Sabre Pro
- 6 Fire Buttons
- Four-way View Hat Switch
- X and Y Axis Trim Controls
- Auto Fire Function for Rapid or Single Fire

$49

NRG120 Cyclone 3-D
- 17 Programmable Fire Buttons
- 3-D "Sweep View" Feature
- Four-way View Hat Switch
- X and Y Axis Trim Controls
- Windows 95 Driver included

$89

NRG121 Magnum 6
- 6 Fire Buttons
- Four-way View Hat Switch
- X and Y Axis Trim Controls
- Joystick to Mouse and Windows 95 Drivers included

$69

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Kodak DC25 Digital Camera

The DC25 is a fully featured model that combines point-and-shoot simplicity with great looking pictures. It holds up to 14 or 29 pictures in built-in memory, depending on the resolution. It features an automatic flash, an optical viewfinder for traditional picture taking and a colour LCD for instant review. The DC25 accepts an optical, compact 2Mb KODAK picture card to make storage easy. Features: Zoom lens - automatically focuses, from 0.5m to infinity. The flash offers 3 modes: automatic, on or off. Automatic exposure, 2Mb internal memory with 493 x 373 high res. capability, 24 bit colour pictures.

STOCK CODE: KOD005

$479

Kodak DC50 Digital Camera

Who else but Kodak could offer all these features at such a remarkable low price:
Zoom Lens - The DC50 zoom camera's precision lens has 3:1 zoom capability that gives you a focal length of up to 37mm. The flash offers three modes: automatic, on or off. Up to a 14' range. The slide cover doubles as your power switch, open it and the camera is ready to take pictures. The zooming optical viewfinder gives you an accurate view of the object your shooting. **Internal memory** - store up to 22 "good", 11 "better" and 7 "best" quality pictures for up to 1 year. **Multi-AF Photometric Window** - The DC50 zoom camera automatically focuses from 0.7 m to infinity in normal mode, from 0.5 m to infinity in Macro. In automatic mode, the light sensor measures the amount of light needed for the flash. The **Zoom Button** zooms from 37mm to 111mm to frame the scene you want without having to change lenses.

STOCK CODE: KOD003

$1159

AUP120 DC-50 PCMCIA Card **$259**

Kodak DC120 Zoom

Colours that snap. Details that pop. Just point-and-shoot the DC120 Zoom Digital Camera and you'll see how easy it is to create exceptional images. Capture a wide shot, then zoom in for the detail with a 3:1 zoom lens - and the LCD display lets you know instantly what you have shot. And with an erase feature you know you'll get the shot your want in rich, precise colour with high resolution 1.2M pixels (1280 x 950), CCD Resolution 836,400 pixel (850 x 964). The camera also features 2MB of internal storage for up to 20 pictures and supports removable 2MB and 10MB Kodak Digital Science picture cards. The camera has variable shutter speeds from 1/500 - 16 seconds, auto focus from 0.5 to infinity, a built in flash, optical view finder, loads of software that lets you add your images to documents easily and much more.

STOCK CODE: KOD008

$1699

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HYUNDAI
DeluxScan Monitors

free 3 YEAR Onsite Warranty

DeluxScan Monitors

Available in sizes from 14" to a massive 21" at highly competitive prices the Hyundai DeluxScan Monitor has all the features you would expect from one of the most innovative and successful electronics companies in the world. Manufactured to the ISO 9001 standard, all Hyundai Monitors are extremely energy efficient and comply with EPA Energy Star/ VESA DPMS power saving requirements. Such features allow Hyundai to back their Monitors with an exclusive three year on-site Australia & New Zealand-wide warranty* service.

Ergonomical front panel controls, higher refresh rates, flicker-free images and low emissions are standard on all Hyundai Monitors. Higher resolutions (up to 1280 x 1024) give you amazing clatiry for every possible application, from Windows to high end graphics and imaging. So whether you want to design a complex 3D model or simply play, the Hyundai DeluxScan monitor is the one for you!

Feature		DeluxScan14S (#HN/HL 4848F)	DeluxScan15G+ (#HL 5870A)	DeluxScan17B+ (#HL 7870A)	DeluxScan 21 (#HL 2882)
CRT	Size	14"	15" FST	17" FST	21" FST
	Dot Pitch	0.28mm	0.28mm	0.27mm	0.28mm
Scanning Frequency	Horizontal	30 - 50 kHz	30 - 70 kHz	30 - 70 kHz	30 - 82 kHz
	Vertical	50 - 130Hz	50 - 150Hz	50 - 150Hz	45 - 100Hz
Video Bandwidth		65 MHz	85 MHz	100 MHz	135 MHz
Displayable Resolution		1024 x 768	1280 x 1024	1280 x 1024	1600 x 1280

NO.1 for Graphics!

Features
- Three year on-site warranty available in Australia and New Zealand*
- Plug and play ready
- On screen digital displays (except 14")
  Compliance with radiation & VESA DPMS standards
- Low-power usage
- Amazing resolution

*3 Year on-site warranty available in Australia & New Zealand through Electronic Resources Australia distribution channels only

PLUG & PLAY

HYA001	Hyundai 14" Monitor	$319
HYA002	Hyundai 15" Monitor	$459
HYA003	Hyundai 17" Monitor	$855
HYA004	Hyundai 21" Monitor	$2399

adaptec - SCSI Cards

Kit Product Matrix

Adaptec SCSI Adapters	Distributor Part Number	Bus Type	Transfer method	Floppy Support	BIOS	#of Device Support	Device Protocol	Peripheral Support	SCSI Transfer Rate/sec	O/S Support	Price	Product Code
AVA-1505VAR TotalCD	DAHA1505VARK TBA	ISA	PIO			up to 7	"SCSI 1,2"	CD-ROM	up to 5MB & Win95	DOS/Win	$99	ADA029
AHA-1522B SCSI Direction	DAHA1522BK ADA0086	ISA	PIO	X	X	up to 7	"SCSI 1,2," Fast SCSI	All standard SCSI*	up to 10MB	All O/S's**	$249	ADA030
AHA-1542CP SCSI Master	DAHA1542CPK ADA0406	ISA	DMA	X	X	up to 7	"SCSI 1,2," Fast SCSI	All standard SCSI*	up to 10MB	All O/S's**	$469	ADA031
AHA-2742AT EISA SCSI Master II	DAHA2742ATK ADA027K	EISA	DMA	X	X	up to 14	"SCSI 1,2," Fast SCSI	All standard SCSI*	up to 10MB	All O/S's**	$669	ADA032
AHA-2920 PCI SCSI PIO	DAHA2920K ADA2945	PCI	PIO		X	up to 7	"SCSI 1, 2," Fast SCSI	All standard SCSI*	up to 10MB	All O/S's**	$269	ADA033
AHA-2940U PCI SCSI Master	DAHA2940UK ADA2950	PCI	DMA		X	up to 7	"SCSI 1,2, Fast" "SCSI, Ultra"	All standard SCSI*	up to 20MB	All O/S's**	$449	ADA034
AHA-3940U PCI Multichannel SCSI	DAHA3940UK ADA3942	PCI	DMA		X	up to 14	"SCSI 1,2, Fast" "SCSI, Ultra"	All standard SCSI*	up to 40MB (20MB/channel)	All O/S's**	$749	ADA035
APA-358A MiniSCSI EPP (SCSI 2)	DAHAT358A ADA3581	Parallel Port	PIO	N/A		up to 7	"SCSI 1,2"	All standard SCSI*	up to 1MB W95/OS/2	Dos/Win/NT	$119	ADA036
APA-1450A SlimSCSI for Removable Drives	DAPA1450A ADA1440	PCMCIA	PIO	N/A		up to 7	"SCSI 1,2," Fast SCSI	All standard SCSI*	up to 10MB	Win 95	$179	ADA037
APA-1460A-2 SlimSCSI Universal Connection	DAPA1460A-2 ADA1467	PCMCIA	PIO	N/A		up to 7	"SCSI 1,2," Fast SCSI	All standard SCSI*	up to 10MB W95/OS/2	Dos/Win/NT	$299	ADA038
EIDE Adapters												
EIDE-AT32 VP Enhanced IDE-AT32 VP	DAHAVPAT32 ADA5501	ISA	PIO		X	up to 4	IDE/EIDE ATAPI	All IDE/EIDE ATAPI	up to 3.3 MB	All O/S's**	$59	ADA039

"*Peripheral Support for Hard Disk, CD-ROM, removables, MO, tape, DAT and Flopticals"

"**O/S Support: DOS(3.3 & up), Win 3.1/Win 95, SCO Unix, Solaris Unix, UnixWare, NetWare (3.1,3.11,3.12 & up), Windows NT (3.1,3.5,4.0), & O/S/2 (2.0,2.1),"

AHA-2920 supports version 3.0 of OS/2 Warp and does not support Solaris Unix.

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PRINTERS

INTERNATIONAL
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EVERYTHING FOR YOUR PC - DELIVERED NATIONWIDE!

EPSON Stylus Color 400

Stunning Quality, Every Time!

NEW PRODUCT

The Epson Stylus Color 400 is is a high quality inkjet printer providing 720 x 720 dpi photo-real output with the addition of some new and exciting enhancements. It is the ideal printer to provide superb 720 dpi results for the home user for both business and personal documents, on all types of paper including plain.

FEATURES
- Up to 720 x 720 dpi high resolution printing in black and white and colour - even on plain paper
- Fast print speeds up to 4ppm* in Monochrome and 3ppm* in colour
- Photo quality output as standard - no additional option required
- Easy-to use printer driver with EPSON answers On-Line manual CD-ROM
- Exclusively for Windows™ only, using EPSON printer driver technology
- The new standard in personal printing performance for home, home office and small business.
- Perfect for greetings cards, calendars, letterheads, reports, presentations, resumes, images and correspondance

NB * The page per minute print speeds are a guide only. Actual print speed may vary under different conditions

EPS134 Epson Stylus Color 400. ..... **$359**

EPSON Stylus Color 600

1440dpi photo real output

NEW PRODUCT

The Epson Stylus Color 600 is a high quality inkjet printer providing 1440dpi photo-real output, ideal for in-house desktop publishing and business and personal documents on all types of paper, including plain. The Stylus Color 600 features Epson's new Perfect Picture Imaging System™, including MicroPiezo Technology™ for small accurate inkdots and AcuPhoto Halftoning Technology™ for accurate colours and smooth graduation. The printer is fully compliant with Windows 95 ICM and Macintosh.

FEATURES
- Up to 4ppm* colour, 6ppm* mono printing
- Photo quality printing up to 1440 x 720dpi
- Superb plain paper printing up to 720 x 720 dpi
- Windows & Mac compatible
- Advanced Dual Ink cartridge system with Quick-Dry ink
- Super MicroDot™ technology produces smaller, precise dots for sharp edges and smooth reproduction of photo images.
- Windows 95 ICM and ColorSync. 2.0 compliance
- The best all-round, high resolution personal printer for home office and small business
- Ideal for presentations, photo image reproduction, reports, flyers, newsletters, letterheads and correspondance

NB * The page per minute print speeds are a guide only. Actual print speed may vary under different conditions

EPS135 Epson Stylus Color 600. ..... **$499**

EPSON Stylus Color 800

Ultra Fast Colour & Mono Printers

NEW PRODUCT

The Epson Stylus Color 800 provides the business user with high-speed colour or mono printing, taking advantage of its high speed colour printing it is designed for multi-platform compatibility and networking. The Epson Stylus Color 800 features Epson's new Perfect Picture Imaging System™, including MicroPiezo Technology™ and AcuPhoto Halftoning Technology™.

FEATURES
- Up to 8ppm* mono, 7ppm* colour printing
- Photo quality printing up to 1440 x 720dpi
- Superb plain paper printing up to 720 x 720 dpi
- Optional Postscript & Network compatibility
- High capacity dual ink cartridge system with quick-dry ink
- Super MicroDot™ technology produces smaller, precise dots for sharp edges and smooth reproduction of photo images.
- Windows & Mac compatible
- The high performance, photo quality printer for business and graphics professionals

NB * The page per minute print speeds are a guide only. Actual print speed may vary under different conditions

EPS136 Epson Stylus Color 800. ..... **$729**

OKIPAGE 16N LED Laser Printer

Ideally suited to shared and heavy-duty work environments and the professional desktop publishing market. The OKIPAGE 16N has SNMP support and the OKI high-speed port offers optional internal connectivity to Ethernet and Token Ring network platforms. For information please call.

Ideal for large Volume Printing

Features
- 16PPM
- 600DPI with gray scales
- 11 secs to first print
- MIPS R3000 RISC 32Mhz CPU
- PCL 5e & optional true Adobe postscript, Level 11 with Appletalk interface Parallel interface
- Save over 24% per unit in total running costs compared to other printers in its class
- 500 sheet input tray optional
- 500 sheet second cassette A4, A5, A6 letter, Executive paper sizes Monarch, COM-10, COM-9, C5, C4 DL envelope
- Extensive networking capability

LED PRINTHEAD 5 YEAR LIMITED WARRANTY

OKI018 Okipage 16N **$1999**

OKI People to People Technology

OKIPAGE 4W LED Laser

Windows 3x, Windows for workgroups and Windows 95 Compatable

A personal printer with low running costs, ideal for Windows users in the small and home office.

With the OKIPAGE 4W you are able to control printing directly from your PC, quickly returning to your application.

Features
- 4PPM
- 600DPI
- Save almost 50% p/unit in tool running cost compared to other printers in its class
- Compact size
- Near silent printing
- Bi Directional parallel interface
- PCL 4.5 & HIPER W (windows printing - GDI)
- A4, A5, B5, A6, Letter, Executive paper sizes Monarch, COM-10, COM-9, C5, C4 Dl envelopes
- Win '95 and Win 3.11 compatible

LED PRINTHEAD 5 YEAR LIMITED WARRANTY

OKI1006 OKIpage 4W **$399**

OKI People to People Technology

OKI 810E LED LASER

The OKI OL810E LED Laser is ideal for the high quality personal desktop publishing market requiring high speed printing (fastest in its class with 14 secs to first print) and a huge 250 sheet standard capacity with versatile paper handling options. It is suited to the shared work group environment and also has an optional True Adobe Postscript Level 2.

Fastest in its Class

Features
- 8PPM
- 600DPI with 123 gray scales
- Save nearly 26% per unit total running costs compared to other printers in its class
- 14 secs to first print
- Larger paper handling capability
- MIPS R3000 RIC 25 MHZ CPU PCL 5E
- Parallel & Serial with automatic interface switching
- Optional true Adobe postscript level 11 with Appletalk interface
- A4, A5, B5, A6 letter, executive paper size Monarch COM-10, COM-9, C5, C4 DL envelopes
- Extensive networking capability

LED PRINTHEAD 5 YEAR LIMITED WARRANTY

OKI1007 Oki 810E. **$1199**

OKI People to People Technology

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PRINTERS

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As Seen On T.V.

Canon - Living Colour

BJC 210/240

Best Selling Printer

Canon BJC 210 Colour Bubble Jet Printer with 360dpi
Thanks to Canon innovation the new BJC-210 bubble jet printer produces revolutionary 3 colour printouts that actually rivals more expensive four colour systems.
Higher resolution- The BJC-210 gives you a resolution of 360 dpi and generates 44% more colour information per square inch than 300 dpi, three-colour inkjets.
Better Contrast- In addition, the BJC-210 has an advanced printer driver that selects highlights and shadows in an image and emphasise them to provide better contrast. The result is stronger colours, particularly for photographic images.

FEATURES
- Resolotion: 720x360dp
- Prints in coated and glossey stocks
- Delivers a richer process black
- Optional Black cartridge for high speed B&ws

CAN003 Canon BJC - 210. ..... **$228**
CAN057 Canon BJC - 240.(Photorealism) **$299**

BJC-4200/4550(A3)

Includes Adobe Photo Deluxe!

Canon BJC-4200 Colour Bubble Jet Printer with 720 x 360 dpi quality and the fastest B&W in its class.
PhotoRealism combines an ink breakthrough with a new image processing system. The result is near photographic quality with smoother colours, more natural gradation and better colour contrast - with almost no discernable grain.
With its unique design and dedicated black ink cartridge the BJC-4200 is capable of printing at laser-like speeds of up to 4.8 A4 pages per minute!

FEATURES
- Resolution: 720 x 320 dpi
- Print Speed: Max **4.8** pages per minute.
- Resolution:Up to 720 x 360 dpi (+ text smoothing with BC-20)

CAN046 Canon BJC - 4200 (A4) **$369**
CAN050 Canon BJC - 4550 (A3) **$739**

Canon BJC-620

Better Colour on Plain Paper

Canon BJC-620 High Resolution Colour Bubble Jet Printer
Better Colour, real 720 dpi printing on plain and coated and true WYSIWYG printing at high speeds.
Our approach lets your computer and its operation system drive a printer more efficiently, especially when large amounts of data are involved.
Better reproduction, twice as fast.

FEATURES
- **50%** to **100%** faster than it's predecessors
- Resolution: 720 x720 dpi
- **4** Seperate print heads with replaceable ink cartridges
- Prints on Transperencies, high gloss film, coated and glossy paper, High Resolution paper, fabric sheets & T-shirt transfers.

CAN040 BJC - 620. ..... **$619**

Canon LBP-660

The Canon LBP-660: a very businesslike printer at 6 pages per minute.

Different people buy different things for different reasons. That's why the new LPB-660 incorporates sophisticated functions like refined halftoning for high-quality graphics-printing, face-up or dace-down delivery for flexible output and toner saver for ecological and economical printing. Taking a closer look there's even more reasons to think of the LBP-660 such as form overlay for easy letterhead preparation, a convenient 100-page multipurpose tray plus manual feeding for more versatile paper handling, and on-screen printer status that takes the mystery out of printing.

For High Quality Business Documents

FEATURES
- High quality, high speed, at great value
- High-resolution 600dpi output (equivalent to 2400x 600 dpi with Automatic Image Refinement)
- High-speed 6 page-per-minute laser printing, at a one-per-desk kind of price
- Up to **6** pages per minute (A4)
- Resolution: 600dpi

CAN047 Canon LPB - 660. ..... **$579**

CanoScan CS-300

An ideal scanner for business or personal use.

Now it's easy to create your own exciting colour document. With 300dpi, the CanoScan 300 delivers consistently high quality colour canning, making it ideal for business or personal projects, such as creating customized greeting cards or newsletters.

More natural colours. Canon's unique Xenon lamp delivers stable, even illumination over the entire document being scanned to ensure greater colour uniformity. And because it more closely resembles natural sunlight, the Xenon lamp also produces more natural-looking colours.

FEATURES
- Free - **$100s** worth of free products to help you get professional results
- Including:PhotoImpact TypeReader OCR V2.0
- Ideal for business or personal projects
- 300dpi

CAN048 CanoScan CS - 300 (dpi). **$479**
CAN051 CanoScan CS - 600 (dpi). **$699**

PowerShot 600

The advanced, easy-to-use digital camera you've been waiting for.

The Powershot 600 is the first "point-and-shoot" digital camera to make high-quality photography affordable. Instead of film, the Powershot 600 captures up to 18 crisp, colour images on 1 MB of internal memory. Or you can expand its image storage capabilities with optional PC cards. PC cards act as digital film that allows you to download your images into a PC or laptop computer. You'll never have to wait for a roll of film to be developed again!

FEATURES
- Extremely bright optical viewfinder makes composing photographs easy
- 7.5 mm f/2.5 lens (equivalent of 50mm lens on a 35mm camera)
- Through the Lens auto-focusing
- Autoflash for up to **12** feet.
- Macro button allows you to shoot close-ups down to **4"**
- 1 MB built in memory
  Accepts both 4MB PCMCIA ATA (PC) cards and **170** MB HD card for greater image security and capacity
- 3 image setting (Fine, Normal, Economy)
- Slot memory card into Notebooks for direct viewing and easy downloading

CAN039 PowerShot 600. ..... **$1299**
CAN058 PowerShot 350. ..... **$879**

Choose a Free CD with every order!

1. **MasterClips 1000** — A collection of professional colour clipart
2. **Starfish Internet Utilities** — Manage your diary, contacts, meetings and communications via the Internet.
3. **Bodyworks V3** — Learn all about the human body with multi-media guide.
4. **TurboCAD V1 Windows** — The most significant release of any CAD software this decade.
5. **EZ Language Version 1** — EZ Language V1 is the fun & easy vocabulary pronunciation tutor for 7 different languages.
6. **Leonardo the Inventor** — A multimedia exploration of the life works of Leonardo da Vinci. (No 3D glasses)

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PRINTERS

INTERNATIONAL SOFTWARE WAREHOUSE Pty. Ltd.

EVERYTHING FOR YOUR PC - DELIVERED NATIONWIDE!

HP LaserJet 6L

Convenient Quality

The Hewlett-Packard LaserJet6L gives out-standing laser print quality at an affordable price. It is a complete, easy to use and convenient printing solution, the perfect replacement for the HP LaserJet 5L.

- 50% Larger Engine Speed
- 1Mb Memory
- 26 Scalable Fonts
- Up to 600 x 600dpi Print Quality
- 6000 Page Duty Cycle

NEW PRODUCT

Amazing Discount!

HEWLETT PACKARD

HWP200 HP LaserJet 6L **$699**

HEWLETT PACKARD HP DeskJet 400

Small footprint, small price tag, big performance.

The HP DeskJet 400 printer provides high-quality colour printing , yet takes up little desk space, operates quietly, and is ready to print vibrant and in full colour from the first time you turn it on.
The included Colour Kit with snap-in ink cartridges gives you the versatility you need to produce both classic black and white documents and colourful marketing pieces. Exclusive HP ColorSmart technology makes adjusting colour for the greatest impact a breeze.

Features

- Snap-in Colour Kit allows printing of full-colour materials
- Exclusive HP ColorSmart eliminates guesswork for vibrant colour at the touch of a button
- Prints up to 16.7 million colours
- Simple three-button front panel and intuitive on-line help with graphical user interface
- Compact design includes paper tray that folds up neatly when not used
- Automatic 50-page sheet feeding

HWP153 HP DeskJet 400C **$275**

HP DeskJet 692C

NEW PRODUCT

Versatile printer with breakthrough photo-quality colour!

The HP DeskJet 690C printer can create rich black and dazzling colour printed pieces from your home or office. Banners, labels, stickers, personalised cards and invitations. Even iron-on transfers. The HP RealLife System ensures true-to-life images. Outstanding print quality with brilliant colours and sharp, crisp blacks. You also get effortless results with HP ColourSmart – it automatically adjusts settings for perfect colour every time and includes Photo Pen.

HEWLETT PACKARD

HWP201 HP DeskJet 692C **$439**

HP DeskJet 870Cxi

Premium printing for professional quality

The HP DeskJet 870Cxi is a state-of-the-art printer for professionals who don't compromise in performance, print quality and network flexibility.
With the RealLife Imaging Sytem featuring C-REt Colour Resolution Enhancement technology - the HP DeskJet 870Cxi delivers vivid, attention getting colour, sharp blacks, and enhanced resolution. And at print speeds that help you complete even the most complex jobs quickly.

- Professional black quality
- Fast black output up to 8 pages per minute
- Fast colour output 4 pages per minute
- Network -friendly
- Black resolution Best mode 600 dpi
- Colour Resolution Best mode 600 x 300 dpi

HEWLETT PACKARD

HWP025 HP DeskJet 870Cxi **$739**

HEWLETT PACKARD

Always clear- always sharp!

HP Paper

Paper & Transparencies for Deskjet, Deskwriter & Paintjet XL300

AUC101	HP Premium Transparency film A4 (20 sheets)	$34.95
AUC102	HP Premium Glossy A4 Paper (10 sheets)	$19.95
AUC105	HP Premium Paper A4 (200 sheets	$34.95
AUC106	Photo Paper A4 20 sheet pack (DJ 690 only)	$19.95
AUC109	HP Greeting Card Paper	$20.95

HP Ink

Ink Cartridges - Deskjets & OfficeJet

AUC110	High-Capacity Black Ink, DJ400/500 serie	$39.95
AUC111	Tri-Chamber Colour Ink, 300/400/500 Serie	$44.95
AUC112	Black Ink, DJ/DW600 Series	$39.95
AUC113	Tri-Chamber Colour Ink, DJ/DW600 Series	$44.95
AUC114	Colour Inkjet Photo Cartridge (DJ 690 only)	49.95
AUC118	Black Ink, DJ1200 Series, CopyJet & DesignJet 2xx, 3xx & 650	$39.95
AUC122	Black Ink, DJ 800, DJ1600 & DesignJet 700 Series	$44.95
AUC123	Tri-Chamber Colour DJ800 Series	$45.95

HP Toner

AUC125	Microfine Toner Cartridge LJ 5L (EP-A)	$99.95
AUC126	Microfine Toner LaserJet 5P, 5MP, 6P & 6MP	$129.95
AUC135	HP Toner Collection Kit Colour LaserJet 5 & 5MV	$39.95

Quality PrintPartner Printers from Fujitsu

Quick, environment friendly and quality printing instantly!

Print for under 3c a copy

With high performance, environment, user friendly and with a resolution of 1200,what more could you ask for from these superb printers from Fujitsu!
The printers use laser/electro-photography with high speed printing of either 10ppm or 14ppm depending on which performance you require. Includes scalable fonts, GL/2 graphic languages PJL control an amazing 1200 dpi class resolution (true 600 dpi print resolution + Advanced FEIT) plus optional Localtalk and Ethernet interfaces for networking environments to make the PrintPartner a network printer.
All of PrintPartner's plastic parts of more than 50 grams are marked for recycling and uses less toner wastage. The printer is also user friendly with an easy set up print menu program and operation panel that makes using the printer simple to use and install!

* Second tray Optional (not included in base price)

FUJITSU

Features of PrintPartner 10 & 14

- 10 pages per minute A4 (or 14 pages per minute A4)
- Automatic feed: A4 or Letter
- Manual feed: A4, Letter, Executive, Envelope, Labels,Transparency.
- Duty cycle of up to 20,000 pages per month
- On PrintPartner 10 Resident RAM 2MB (expandable to 34MB)
- On PrintPartner 14 Resident RAM 3MB (expandable to 35MB)
- Print resolution 600 x 600 dpi + Advanced FEIT
- Paper tray with 250 sheets capacity (0.09mm thickness)

AUP158 Fujitsu PrintPartner 10 ..... **$1169**

AUP159 Fujitsu PrintPartner 14 ..... **$1809**

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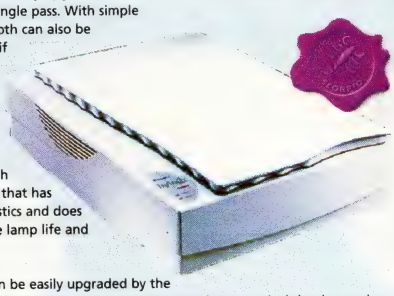
IF YOU CAN FIND IT CHEAPER CALL US - WE WON'T BE BEATEN!* *See page 3 for Price Pledge

TECO Infinity Scorpio

Teco Infinity Scorpio - The last scanner you'll ever buy!

The infinity Scorpio features an upgradeable modular style CCD unit, motherboard, and memory. These easily changed modules allow the optical resolution, interpolated resolution, and pixel depth to be quickly and easily upgraded. The infinity Scorpio scanner captures 30 bits of colour at 300 x 1200 dpi in a single pass. With simple components the Scorpio pixel depth can also be upgraded to 36 bit in the future if desired. By adding RAM to the scanner's motherboard, the image capture speed can be significantly increased.



Green Scanner

The Infinity Scorpio uses a technology called Cold Scan which incorporates a Xenon glow lamp that has excellent temperature characteristics and does not require ventilation, therefore lamp life and energy is conserved.

Buffer Size

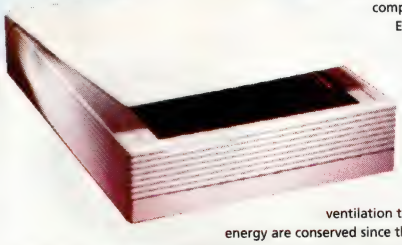
The Buffer Size of the Scorpio can be easily upgraded by the users to 4 M maximum to significantly improve the scanning speed. Image pixel depth can also be upgraded to 36 bits per pixel in the future.

Technical Specifications

Light source:	Xenon glow lamp using cold scan technology
Scanning Area	216mm x 356mm
Resolution	Optical 1640 x 1640 dpi in increments of 1 dpi Maximum 9600 x 9600 dpi by software interpolation
Image Date	Colour: 30 bits per pixel, 1 billion colours Gray Scale: 10 bits per pixel 1024 levels Bi-Tone: 1 bit per pixel
Raw Scanning Speed:	40 seconds for A4 size document (300dpi, colour)
Interface:	SCSI-2 for PC, Macintosh
Transparency Adaptor:	Optional

TEC103 Teco Scorpio **$789**
TEC104 Teco Scorpio + OmniPage V7 (OEM) **$879**
TEC105 Transparency Adaptor **$549**

TECO AVEC II E3 Flatbed Scanner



An ideal choice for office and home users, AVEC II series scanners offer you the efficient colour canning solute in a compact size unit. Through the EPP interface, AVEC II scanner enables you to scan text, photos, magazines, books and other illustrations with one-pass scanning up to 4800 dpi resolution

Using an advance Coldscan technique, the scanner does not require ventilation to cool down. Lam life and energy are conserved since the scanner does not require a warm up time and automatically shuts-off when in use. Dust reference is reduced because the modularized optical unit is completely enclosed.

Technical Specifications

Resolution	Optical: 300 x 600 dpi in increments of 1 dpi
Maximum	9600 x 9600 dpi by software interpolate
Speed	10.8 msec/line
Colour Mode	24 bit, 16.77 million colours
Interface	EPP

*The AVEC II S3, despite being the cheapest scanner in the review was voted by the majority of our panel as having the closest default scans to the originals for both colour and grayscale ..." Australian PC World

TEC101 AVEC II E3 ..... **$245**
TEC102 AVEC II E3 + OmniPage v7 (OEM) **$489**
TEC106 AVEC II S3 (SCSI) **$399**

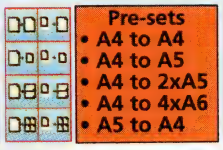
Colour Copier

Turn your scanner & printer into a colour photocopier

Colour Copier turns your colour scanner and colour printer into a full-featured photocopier. Simply place your original in the scanner and set your copy Features! Large corporations have invested millions in developing the interface for both simple and complex photocopiers. Colour Copier emulates that interface, allowing everyone to produce both simple and complex copies, from the scanner to the printer.

- Use contrast and brightness pre-sets or create your own.
- Pre-sets supplied for text only, black and white photos, colour photos, and Newspapers.
- Supports up to 16.7 million colours.
- Rotate images
- Mirror Images
- Add date and time stamp to your copy with comments.
- Save scan to disk for later duplication.

Pre-set supplied



Pre-sets
- A4 to A4
- A4 to A5
- A4 to 2xA5
- A4 to 4xA6
- A5 to A4

- Enlargement to all sizes
- Reduction to all sizes
- Copy multiple originals on to one sheet
- Select area of original to be copied, so that you only copy the article of interest.
- Support for Statement, legal and Letter paper sizes.
- Variable quality setting.
- Draft (low resolution)
- Standard (medium resolution)
- Variable DPI

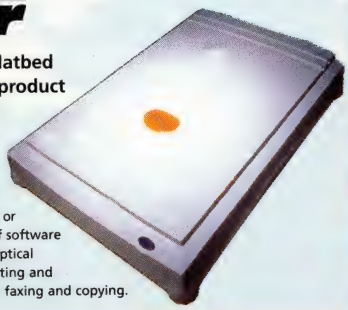
Sostware comes with position presets or you can create your own. It's so easy!

STOCK CODE: SWS001

$95

Plustek OpticPro 4830P Flatbed Scanner

The OpticPro 4830P colour Flatbed scanner is a feature packed product at a very affordable price.



Not only does it share the specifications of many high-end scanners-such as single pass scanning, a cold-cathode lamp and up to 4830dpi resolution- it also installs in minutes without any additional hardware or tools. Add to that a unique collection of software offered only by Plustek! Software for Optical Character Recognition (OCR), photo editing and multifunction document processing like faxing and copying.

Features

- Fax sending Facility with Microsoft Windows™ and your fax software
- Use your Windows-compatible printer with the OpticPro 4830P as a copymachine
- Scan printed documents upto letter/A4 size
- Included OCR software to convert printed pages into word processing documents
- With the image filing software you can store and retrieve important papers
- One-Touch Activation-ready to fax, copy or OCR
- Full 32-bit colour depth, nearly 1 billion colours and can scan in 256 level grayscale or B/W
- 600dpi resolution, or up to 4830dpi with software interpolation
- Long-life scanning lamp
- Detects all colours in a single pass
- Avoid interface cards, connect to your parallel port, plug in and just start scanning
- No jumpers to change or fumble with and no tools required for installation
- Scanning area of 216x297mm (WxL), 8.5x11
- Colour: 33 seconds per A4 colour page, Grey scale: 11 seconds per A4 colour page, Black and White: 11 seconds per A4 colour page

CRE008 Plustek OpticPro 4830P Flatbed Scanner **$309**

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MICROTEK High-Tech Scanning

Introducing "Simple SCSI"

The E3 Scanner now ships with "simple SCSI". Simple SCSI is a special cable with a built-in SCSI-to-parallel converter. Your standard SCSI scanner can be plugged straight into your PC's parallel port - No need to install an interface card. It's pass-through, which means you can use both your printer and your E3 scanner off the same parallel port connector.

All E3 Scanners also come with PhotoImpact SE (PC) & Colorit (Mac) Editing

All MICROTEK scanners include:

- *ScanWizard for Windows 3.1, 95, NT & Mac*
- *OmniPage LE OCR for both Windows & Mac.*
- *12 months warranty.*
- *Free phone support for 1 installation .*

Most software, drivers & manuals are supplied on CD.

MICROTEK 35T Plus

30 BIT Colour

High-speed, high-resolution Slide Scanner

- 30 Bit Colour (1 pass)
- 3,900 x 1,950 DPI Optical
- 3,900 DPI Interpolated
- Dedicated slide scanner to get the best sharpness and detail from slides.
- Scans both negatives and positives.
- Scans strips or mounted slides.

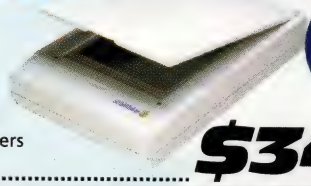
PRO504 **Microtek 35T Plus..... $1149**

MICROTEK E3

Add exciting Colour and Images to your Computer

- 24 Bit Colour (1 pass)
- 600 x 300 DPI Optical
- 4,800 DPI Interpolated
- A4+ Size (8.3 x 13")
- Brighter, clearer images than other SOHO scanners

Best Value SOHO scanner



PRO501 **Microtek E3..... $349**

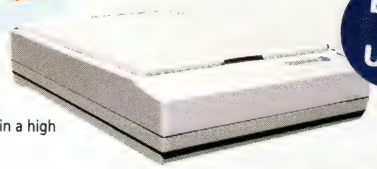
Microtek E6 and Scanmaker 3 Include Imaging software for PC & Mac

MICROTEK E6

The new standard for affordable high quality Scanning

- 30 Bit Colour (1 pass)
- 1200 x 600 DPI Optical
- 9,600 DPI Interpolated
- Legal Size (8.3 x 13")
- Captures 4 times the detail of entry level "600 dpi" scanners.
- "Everything you could ask for in a high resolution scanner".
- PC WORLD Editor's Choice

Easy to Use!



PRO502 **Microtek E6..... $695**

ScanMaker3

The best Quality Flat Bed Scanner

- 36 Bit Colour (1 pass)
- 1,200 x 600 DPI Optical
- 9,600 DPI Interpolated
- A4+ Size (8.3 x 14")
- Best optical quality. The professional choice
- PC MAGAZINE Editor's Choice.

Best Quality at a great price

PRO503 **ScanMaker3..... $2099**

ScanWizard

Free with every Microtek scanner

According to PC MAGAZINE "arguably the best in the business", ScanWizard gives you complete control over your MICROTEK scanner and the way you want your images scanned.

To scan an image, you first select colour, greyscale or line-art output. A live preview then shows you what is on the scanner's flatbed so you can select 1 or more images. You can of course simply use default automatic settings and by clicking on SCAN obtain effortlessly a top quality scan which will be very very close to the original !

With ScanWizard, matching the quality of your original image is not a challenge, simply a starting point. Why not make the image look better than the original? Based upon what you see on the screen, you can apply at time of scanning a host of image enhancements and filters. You may prefer a softer or sharper looking image. By boosting the colour saturation, you may want to give your pictures that "travel brochure look". You are in control !

Each time you apply a filter you can see the result on the screen, thanks to ScanWizard's Live Preview which shows you before and after images. This makes ScanWizard more fun, more powerful and easier to use than other scanning software.

For the advanced user, ScanWizard also includes a host of features like batch scanning, de-screening, exposure control, curves and levels, zoom preview and much more !

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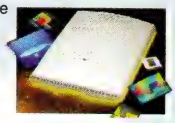
Transparency Media Adaptor

The Transparent Media Adaptor (TMA) lets you scan 35 mm slides and photographic transparencies up to 8x10". Very easy-to-install (clips on; no screws!), it simply replaces the scanner's lid.



Adobe Photoshop 4

CD version.Special price if ordered with a MICROTEK scanner: ***$259***

Automatic Document Feeder.

For unattended scanning in line-art mode for use with O.C.R. software. Simply replaces the scanner's normal lid.

SCAN / COPY Utility

Quick-panel let's you scan directly to your existing printer, fax card or disk file. For Windows 3.11/95. **FREE** with all MICROTEK Scanners.

PRO506 **TMA for MICROTEK E3 or E6..... $599**

PRO509 **TMA for ScanMaker 3..... $599**

PRO508 **Photoshop 4 with Microtek Scanner..... $259**

PRO510 **Automatic Document Feeder E3/E6/SM3..... $599**

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MODEMS

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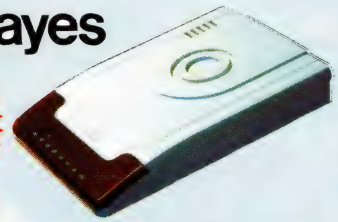
Accura 336 Data/Fax/Voice

Hayes



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From the inventor of the PC Modem!

When technology changes, isn't it best to go with the industry standard? Experience the Internet, online services, bulletin boards, e-mail, cybershopping, faxes and professional message centre software. Available Windows® or Macintosh PC's.

Optima Business Modem

World's fastest modem 230, 400 bit/s Voice/Data/Fax, remote configuration, security flash upgradeable, leased line ideal for business or the power user.

AUP169 Accura 33.6K Modem **$215**

AUP171 Optima PC Card Modem GSM ... **$429**

AUP172 Optima Business Modum V34 .... **$359**

Hayes Accura 56K Speakerphone Modem

How fast do you want to get there?

56.6K SVD Modem

With the ACCURA 56K, you get the fastest Internet access over ordinary phone lines and the legendary Hayes reliability. Professional quality messaging system provides Voice Mail and Fax-on-Demand. A single line can turn any remote office into a professional message centre. Why settle for a Hayes compatible modem when you can have a genuine Hayes modem?

Stock Code HAY021

$329

Features

- Professional, Multiple Voice mailbox System - Create and manage multiple voice mailboxes remotely.
- Fax-On-Demand - Now you can provide ultra fast response to customer's inquiries
- Flash ROM Upgrades - Fast, flexible and easy upgrades to modern features, eliminate obsolete equipment
- V.34 Support - Modems support ITU-T V.34 technology to provide maximum support when connecting to V.34 modems
- 5 year warranty, free lifetime technical support

HAY022 Accura 56K Speakerphone Internal Modem **$299**

HAY023 Accura 56K Data/Fax External Modem **$255**

HAY024 Accura 56K Data/Fax Internal Modem **$229**

Modem Wizard 97

Make Perfect Modem Connections Every Time - Automatically

Modem Wizard is the smart, easy way to optimise your online connections. From one easy to use and understand program youill automatically configure all your Windows dial-up networking, and TCP/IP Internet setup. Automatically configure Netscape Navigator, Microsoft Internet Explorer and AOL. Troubleshoot and eliminate modem and Fax/modem problems. Make sure youire making the best connection every time!

Eliminate these problems:

- Modem won't dial
- Dials but won't connect
- Hangs up for no reason
- Will not answer
- Doesn't connect at right speed
- No dial tone
- Connections seem too slow
- Fax/modem not recognised
- Works fine in DOS but not Windows
- Dial-Up Networking doesen't work right
- Can't get you Internet Access ISP configured properly
- Changed Internet Sercice Providers and can't get on the net

Includes TrueSpeed, Modem Monitor, Modem Exchange & much, much more!

Designed for Microsoft Windows 95

KIS018 Modum Wizard **$49**

Simple Modem 336 Data/Voice Modem

Simplecomputing

With a Simple Modem you can be sure that you're getting the best value for money modem with stacks of features.

Fax Direct form your PC

Send and receive faxes. Simple Modem allows you to send and receive faxes directly from your PC as easily as printing.

VoiceMail messaging

You can set up to 9 password protected voice mail boxes to receive you and your work associates voicemail and fax messages. This means that each member of your office team can have their own mailbox each with a personalised greeting to receive voice mail messages and faxes while they are out of the office.

Fax on Demand

Fax on Demand facility allows your customers to call and get a stand document, such as rochures, and automatically faxed back to them.

Win & Win95 Internet Software

Instantly Surf the Internet with the Internet software from OzEmail.

5 Year Warranty

All Simple modems come with Simple's free 5-year warranty and free lifetime technical support from Australian technical support offices.

Includes

- User's Guide
- Win/Win 95 Data Fax & Voice software warehouse Telephone Connection Cables
- Win/Win 95 Internet software
- 9 Volt Power Plug Pack
- Serial Connection Cable to your PC

BAN001 Simple Modem 33.6 (ext) **$179**

Choose a Free CD with every order!

1. MasterClips 1000 — A collection of professional colour clipart
2. Starfish Internet Utilities — Manage your diary, contacts, meetings and communications via the Internet
3. Bodyworks V3 — Learn all about the human body with multimedia guide.
4. TurboCAD V1 Windows — The most significant release of any CAD software this decade
5. EZ Language Version 1 — EZ Language V1 is the fun & easy vocabulary pronunciation tutor for 7 different languages
6. Leonardo the Inventor — A multimedia exploration of the life works of Leonardo da Vinci. (No 3D glasses)

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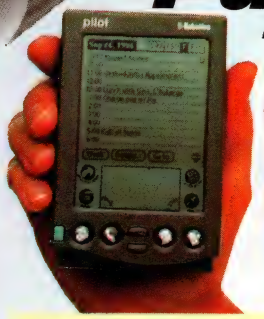
SYDNEY 2015

MODEMS

INTERNATIONAL SOFTWARE WAREHOUSE Pty. Ltd.

EVERYTHING FOR YOUR PC - DELIVERED NATIONWIDE!

PalmPilot



To keep you organized and in-touch with your PC!

INCLUDES FREE CABLE

Note: existing Pilot 1000/5000 users can upgrade to Palm Pilot Professional with this 1 meg upgrade card

NEW PRODUCT

- Features for PalmPilot Personal & Professional
- Back-lit Display
- PC Link (download & Upload information)
- Shirt pocket size & light weight
- Instantly syncs data with your PC's Popular Application: Microsoft Schedule+, Lotus •Organizer, Symantec ACT!, Now Up-To-Date, Sidekick, ECCO, Day-Timer Organizer, •Maximizer, Franklin Ascend 97 and more.
- Flashroom upgradeable
- Programmable using "Code Warrior" for MAC/PC
- 2 x AAA battery (included in pack)
- Storage Capacity:
- PalmPilot Personal (512K) edition: 2500 addresses, 2400 appointments, 500 "to do" •items and 500 memos.
- PalmPilot Professional (1 Meg) Edition: 4000 addresses, 2400 appointments, 750 "to do" items, 750 memos and 100 emails.

USR020 PalmPilot Personal **$459**

USR021 PalmPilot Professional **$575**

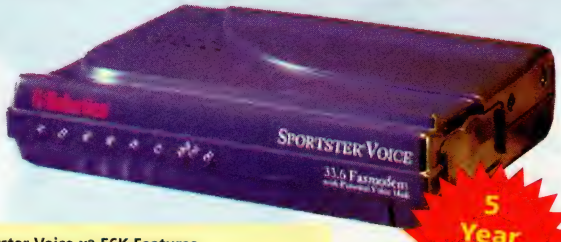
USR024 1 Meg upgrade card **$157**

Sportster Voice

NEW PRODUCT

x2 56K (External)

Quality at an affordable price



5 Year Warranty

Sportster Voice x2 56K Features

- Fax/Modem with Digital Personal Voice
- Full Duplex Speaker Phone (Handsfree Telephone)
- Fast data transmission 56.6K depending on server
- Plug & Play (WIN 95)
- Reflash ROM
- 5 Year Warranty

For more information about any of the above products please look up the US Robotics Webpage: http://www.usr.com.au

USR018 Sportster Voice x2 56K (External) **$269**

Also available (not pictured)

USR022 Courier V. Everything 33.6K (external) free upgrade... **$389**

USR023 Worldport 33.6K PCMCIA Card..... **$345**

Banksia Wave SP

FREE WEB & INTERNET SOFTWARE

The fully featured 33,600bps modem!

The Wave SP is the first modem to be awarded a prestigious Australian Design Mark in recognition of design excellence and innovation.
The assessment panel commented that "(the Wave SP) is radically different from its competitors and upholds the highest principles of unitary design".

5 YEAR WARRANTY

Banksia's revolutionary new wave SP Fax Modem includes;

- High speed data transmission at 33,600bps
- Fax transmission at 14,400bps
- Simultaneous voice & data (SVD) transmission
- Full duplex speakerphone (hands free telephone)
- Fully featured smart answerphone
- Microsoft Internet Explorer™ for Internet surfing & Web site construction
- The best new games
- A radical new shape for optimum audio performance

AUSTRALIAN DESIGNMARK 1997 GOOD PRODUCTS BY DESIGN Banksia Technology Pty Ltd Wave SP Licence No. 96034 STANDARDS AUSTRALIA

AUZ134 Banksia Wave SP Fax Modem **$229**

ComboCard 336

Network, Internet, Fax & Remote Communication in One Card

Ideal for the mobile professional

Features:

- Network and remote connectivity via LAN
- Remote connectivity via phone line
- Send and receive data at speeds up to 33,600bps
- Fax direct from your PC at 14,400bps
- Simultaneous ethernet & faxmodem operation
- Sleep mode conserves your notebook's battery
- Smart answerphone

BAN002 Combo Card **$499**

Banksia GSM Card

One modem for standard phone & digital mobile

Banksia's GSMCard is the ideal solution for the executive on the move. Check your e-mail, or send and receive faxes and data files as easily from your car, hotel room, or home, as from the office. The Banksia GSMCard links your notebook computer to a GSM digital mobile phone or a standard telephone line, allowing you to fax and transmit data over standard telephone lines (PSTN), as well as over GSM cellular networks using your digital mobile phone.

Stock Code AUZ135

$539

**Call us for pricing on a connector kit to suit your phone

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INTERNATIONAL SOFTWARE WAREHOUSE

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Sales Lines Open 9am til 6pm Monday to Friday and 10am til 3pm Saturday.

VISA MasterCard

IF YOU CAN FIND IT CHEAPER CALL US - WE WON'T BE BEATEN!* *See page 3 for Price Pledge

NetComm Roadster 56K X2

For Home & Business Internet users

The Roadster 55.6K X2 users the latest telephone exchange technology, delivering greater speed, so now the worldwide web is made more exciting - with super fast downloading of graphics, games and multimedia.

When 56K becomes ratified by the International Telecommunications Union, your Roadster56 will easily be upgraded to the new standard through a simple software download - so there will be no deed to send back your modem.

Features

- Australian designed & manufactured
- Voicemail facility will answer fax & voice calls, take messages, notify intended recipients & forward as necessary (can even be set to operate as a FaxBack)
- HandsFree/Speaker Phone function enables user to dial & hold a conversion via the modem (supplied with a headset and includes and inbuilt mic)
- Includes fax/data & Internet software warehouse Includes all cables
- Supports Telstra's Faxstream Duet and Caller ID
- LIFETIME Warranty with 1800 free support
- 300-56,000bps asynchronous data
- 2,400-14,400bps Group III fax
- Inbuilt error correction & data compression

Quality Endorsed Company

AUP315 **Roadster 56K X2 (external)** **$269**

NET130 **Roadster 55Kflex (internal data/fax)** **$215**

NET131 **Roadster 33.6K (external)** **$189**

NetComm

EtCardModem 336 + Ethernet

Ideal for the mobile professional

The CardModem 336 plus Ethernet allows you to send and receive faxes, voice and data like a normal modem, but with the added ability to also connect to an Ethernet LAN. So you can be connected to your office and the world with a single card. And you're guaranteed compatibility with all popular network operating systems, including Novell 3.11 or higher, Banyan Vines, Windows for Workgroups, Windows 95, Windows NT and Artisoft LANtastic. Plus by adding a simple optional adapter cable you can link your PC and analogue mobile phone for direct-connect communication.

True Simultaneous Multifunction Capability

Connect to your LAN and use your modem simultaneously without affecting performance.

High-speed error free connection to the Internet or your remote LAN server is easy with 4:1 compression, transmission speeds of up to 115,200bps.

Enjoy fax-from-your-PC functionality with Group 111 compatible fax modem.

Electronic Security

The CardModem 336 plus Ethernet includes voice mail capabilities with Electronic Secretary software package allows you to turn your PC into an automatic messaging service.

Quality Endorsed Company

NetComm

NET015 **CardModem 33.6 + Ethernet** **$459**

AUP173 **CardModem 33.6 V34** **$359**

8 Reasons why 1,000's of buyers choose Software Warehouse every month!

- **Price Pledge** — We will beat any advertised price on any identical product. Subject to terms & conditions P2
- **Free Gift** — With every order choose a free gift from the selection on page 2.
- **Fast Delivery** — Overnight delivery on 90% of orders
- **Free Delivery!** — We do not charge for delivery on orders over $200, providing they weigh less than 3Kg. For other deliveries see chart on page 2.
- **Nationwide Delivery** — We can deliver to any location in Australia, quickly. Whatever it takes, we deliver.
- **Massive Stocks** — Our aim is to fulfil 95% of orders from stock. Our financial stability enables us to hold more than 10,000 items in stock at any one time.
- **All Welcome!** — We always service the individual buyer, small business and large corporation to the same high standard.
- **No.1 Service** — As an International company we have won more awards for products and services than any software mail-order company.

CreditCard Ethernet Adaptor 10/100

Designed for Microsoft Windows 95

Connect portable PCs to 100Base-TX Ethernet networks with this high-performance PC Card adaptor!

Portable PC users can now connect to both 10Mbps Ethernet and 100Mbps Fast Ethernet networks with this high-performance PC card. Fast Ethernet is the natural migration path for over-burdened 10Mbps Ethernet networks. Now portable PC users who use graphics-based, network-intensive applications such as database access, imaging, and CAD/CAM, as well as the growing population of e-mail and internet users, can enjoy the benefits of having access to the increased band-width of 100Mbps Ethernet networks for improved response time. **The CreditCard Ethernet 10/100-Ready** provides instant access to both 10Mbps and 100Mbps networks with a single adaptor cable. **The CreditCard Ethernet 10/100-Upgradeable** models are 10Mbps adaptors for those who plan to implement Fast Ethernet in the future, but prefer a cost-effective, upgradeable solution today.

Xircom CE

XIR010 CreditCard Ethernet Adaptor 10/100 ... **$299**

PC Card Ethernet + Modem 33.6

Designed for Microsoft Windows 95

The fastest performing combination PC Card on the market today! Ideal for use at home, in the office and on the road

The CreditCard Ethernet+Modem 33.6™ revolutionises mobile connectivity by combining both a high-performance Ethernet LAN adaptor and high-speed V.34 data/fax modem in a single PC Card. The 33.6 Kbps data/14.4 Kbps fax modem capabilities provide users with the most reliable, high-speed communications available. The CreditCard Ethernet + Modem 33.6 features simultaneous use of Ethernet LAN and data/fax modem connections making it the ultimate high-performance mobile connectivity solution.

Xircom

AUP168 PC Card Ethernet Combo (TP & BNC) + 33.6 Modem **$599**

AUP100 PC Card (TP) + 33.6 Modem **$539**

CreditCard Modem 33.6

Designed for Microsoft Windows 95

The high-performance modem that gives you the freedom to communicate with the world, anytime, anywhere!

In the office, at home, or on the road, Xircom's CreditCard Modem 28.8™ provides high-speed modem connectivity for the mobile professional. Whether accessing E-mail, downloading or faxing files, or accessing on-line services such as the Internet, the CreditCard Modem 28.8 provides a high-performance,reliable and easy-to-use solution for communicating to the world from any location, at any time.

Features include

- Lifetime warranty and a future-proof Upgrade Program
- Digital Line Protection safeguards your modem against high-current digital phone lines
- 'Plug-&-Play' operation, Windows 95 supported
- Includes Delrina WinFax and WinComm Lite software for direct fax capabilities from Windows
- Flash ROM for future upgrades
- Approved in most European and Asia-Pacific countries
- CountrySelect Utility and Multi-lingual user guide included

Xircom CE

AUP119 CreditCard Modem 33.6 ..... **$269**

All prices INCLUDE sales tax. Prices subject to change, see page 3 for terms & conditions.

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Enquiries 02 9700 8800 Internet site www.software-warehouse.com

INTERNATIONAL SOFTWARE WAREHOUSE Pty. Ltd.

EVERYTHING FOR YOUR PC - DELIVERED NATIONWIDE!

Quantum™

High Speed 3.5"Hard Drives

TP Code	Model	Name		Price
QUA102	QM31620ST-A	Fireball ST 1.6GB AT	3	$339
QUA104	QM32160ST-A	Fireball ST 2.1GB AT	3	$389
QUA106	QM32160ST-S	Fireball ST 2.1GB SCSI	3	$549
QUA108	QM3324OST-A	Fireball ST 3.2GB AT	3	$495
QUA110	QM3324OST-S	Fireball ST 3.2GB SCSI	3	$639
QUA112	QM3432OST-S	Fireball TM 4.3GB AT	3	$606
QUA114	QM3432OST-S	Fireball TM 4.3GB SCSI	3	$769
QUA116	QM3432OST-S	Fireball TM 6.4GB AT	3	$849
QUA118	QM3648OST-S	Fireball TM 6.4GB SCSI	3	$959

High Speed 5.25"Hard Drives

QUA120	QM52111CY-A	Bigfoot CY 2.1GB IDE	3	$339
QUA121	Pack of 10	Bigfoot CY 2.1GB IDE	3	$3345
QUA122	QM34335CY-A	Bigfoot CY 4.3GB IDE	3	$380
QUA123	Pack of 10	Bigfoot CY 4.3GB IDE	3	$4385
QUA124	QM56510CY-A	Bigfoot CY 6.5GB IDE	3	$599
QUA125	Pack of 10	Bigfoot CY 6.5GB IDE	3	$6175

Seagate

Seagate Eide 3.5" Hard Drive

SEA063	1.7GB	3	$330
SEA039	2.5GB	3	$389
SEA064	6.4GB	3	$849

Seagate Ide 2.5" For Laptops

SEA067	1.3GB	3	$399

NETGEAR

PCI 10/100 Ethernet Adaptor

BAY109 8 PCI 10 /100 Ethernet Adaptor $119

FE500 Fast Ethernet Hubs

BAY100 8 Port 100BaseTX Stackable $1319

BAY101 16 Port 100BaseTX Stackable $2259

SW500 Ethernet Switches

BAY102 6 Port 10Base 1 10/100BaseT $2589

BAY103 2 Port 10/100BaseT $889

EN100 Ethernet Hubs

BAY104 16 Port 10BaseT w/AUI & BNC $369

BAY105 8 Port 10BaseT w/AUI & BNC $219

BAY106 16 10BaseT Stackable Hub $509

BAY107 8 10BaseT Port w/AUI & BNC $279

BAY108 4 10BaseT Port with BNC Port $149

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KINGSTON MEMORY

Upgrading memory can improve performance and increase productivity by up to 63%.* An independent study tested the effects of memory in PCs running Windows 95 or Windows NT 4.0. In all cases, PC performance improved with the addition of memory. Test results* indicated that the average PC's Windows 95 performance increased 15-20 % when the memory was upgraded form 16MB to 32MB. Performance on the same system running Windows NT 4.0 will increase 35-45% with the same upgrade. Now is the perfect time to take advantage of low memory prices and prepare corporate wide hardware platforms for migrations to Windows NT and other high performance applications.

• LIFETIME WARRANTY •

KINGSTON MAKES MEMORY FOR MORE THAN 3,000 DIFFERENT SYSTEMS.

Memory prices change constantly - please call us for current pricing on any Kingston or Generic memory you require.

The Global Networking Company 3Com

Adapters

Code	Part No.	Name	Inc. TAX
AUP101	3C515-TX	Fast EtherLink 10/100 Base-TX ISA (Cat 5 UTP)	$269
AUP102	3C515-TX-5PK	Fast EtherLink 10/100 Base-TX ISA (Cat 5 UTP)	$1269
3CM023	3C905-TX	Fast EtherLink XL PCI 10/100 Base-TX (Cat 5)	$229
3CM024	3C905-TX-5PK	Fast EtherLink XL PCI 10/100 Base-TX 5	$1049
3CM014	3C900-TPO	EtherLink XL PCI-TPO	$185
3CM015	3C900-TPO-5PK	EtherLink XL PCI-TPO (5-pack)	$879
3CM016	3C900-COMBO	EtherLink PCI - Combo	$225
3CM017	3C900-COMBO-5PK	EtherLink PCI - Combo (5-pack)	$1029
AUP111	3C509B-TP	EtherLink III TP	$189
AUP112	3C509B-TP-5PK	EtherLink III TP (5-pack)	$779
3CM002	3C509B-TPO	EtherLink TPO Single	$159
3CM005	3C509B-TPO-5PK	EtherLink TPO Integrator Pack - 5 Pack of TP	$729
3CM003	3C509B-COMBO	EtherLink III Combo Single	$209
3CM006	3C509B-COMBO-5PK	EtherLink III Combo (5 Pack)	$889
AUP117	3C509B-TPC	EtherLink III ISA TPC combo (single)	$189
AUP118	3C509B-TPC-5PK	EtherLink III ISA TPC combo (5 pack)	$859

OfficeConnect

Code	Part No.	Name	Inc. TAX
AUZ125	3C16700-AA	OfficeConnect Hub/8TPO-Basic Unmanaged	$259
AUZ025	3C16701-AA	OfficeConnect Hub/8TPC-Basic Unmanaged	$319
AUZ127	3C16710-AA	OfficeConnect Hub/8TPM-Managed Hub	$829
AUZ128	3C16720-AA	OfficeConnect Hub/8TP100-Managed Hub	$1499
AUZ129	3C16730-AA	OfficeConnect Switch 140, 4x10 Base T	$1599
AUZ130	66298600748	Castelle OfficeConnect Fax Server	$2349
AUZ131	66298600742	Castelle OfficeConnect Print Server	$699

Ethernet PC Cards

Code	Part No.	Name	Inc. TAX
3CM009	3C589C-TP	EtherLink III LAN PC Card, TP	$229
3CM020	3C589C-TP-5PK	EtherLink III LAN PC Card, TP Five Pack	$1049
3CM021	3C589C-COMBO	EtherLink III LAN PC Card, Combo (coax &	$309
AUZ122	3C589C-COMBO-5PK	EtherLink III LAN PC Card, Combo (coax &	$1409
AUZ123	3C563C-TP-AA	EtherLink III LAN +233.6 Modem PC Card	$549
AUZ124	3C563C-COMBO-AA	EtherLink III LAN +33.6 Modem PC Card	$619

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INTERNATIONAL SOFTWARE WAREHOUSE Pty. Ltd.

LEARNING

IF YOU CAN FIND IT CHEAPER CALL US - WE WON'T BE BEATEN!* *See page 3 for Price Pledge

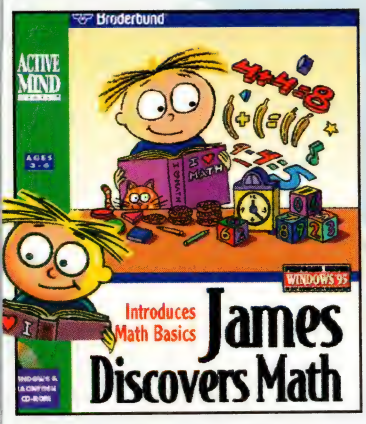
James Discovers Maths

Designed for Microsoft Windows 95

Grades: Pre-1 • Ages: 3-6

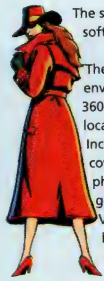
James Discovers Math introduces children to maths concepts, through ten skill-building activities set in an engaging mathematical world filled with activities, puzzles and a humorous counting story about James. Skills learned include counting, number recognition, addition, subtraction, estimation, shape recognition, time telling and more!

CD Mac/Win



BROD16 James Discovers Maths **$65**

Carmen 3 Where in the World is Carmen Sandiego? 3.0



The search for the world's most elusive software character is on again!

The new Carmen offers an immersive environment in which the player can take a 360-degree walking tour through each location and experience the local culture. Includes an extensive electronic database covering 50 countries includes videos, photographs, short essays and geopolitical maps.

Very shortly there will also be the Carmen Sandiego ACME Internet Headquarters Web Site, designed to provide access to geography resources published on the World Wide Web.

CD /WIN/WIN 95
MAC

Designed for Microsoft Windows 95

BROD15 Where In The World isCarmen 3 ..... **$65**

Learning Advantage

The award-winning Living Books line is now available in two library collections, offering great value of four products for the price of two. In Living Books Library 1, favourite titles including Stellaluna, The Tortoise and the Hare, Ruff's Bone, and Little Monster at School will keep children aged 3 to 8 entertained for hours. With this compilation of products, you get to play and learn with some of the latest product offerings from Living Books as well as classic titles that created the Living Books phenomenon.

The combination of classics combined with the latest products also features in Living Books Library 2. Included in this line-up are Just Grandma and Me, Sheila Rae, The Brave, Harry and the Haunted House, and The New Kid on the Block.

LIBRARY 1 PLATFORM CD

CD /WIN/WIN 95
MAC

Designed for Microsoft Windows 95

BROD10 Learning Advantage 1 ..... **$119**

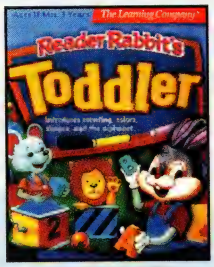
BORD11 Learning Advantage 2 ..... **$119**

Reader Rabbit's Toddlers

Designed for Microsoft Windows 95

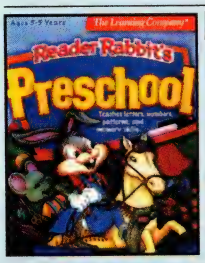
• Ages 18 months to 3yrs

his highly engaging program teaches essential skills for children aged 18 months to 3 years. Includes colours, shapes, counting and the alaphabet, Reader Rabbit and Mat the Mouse take children to enchanted playlands loaded with charming interactive activities, cute animal friends and delightful songs and beloved nursery rhymes. CD /WIN/WIN 95



SOF200 Reader Rabbits's Toddlers **$45**

Reader Rabbit's Preschool



Designed for Microsoft Windows 95

• 3 to 5yrs

Learn letters, numbers, patterns and boost memory skills while having loads of fun. Targeted specifically at Preschoolers, Reader Rabbit's Preschool is chock-full of educational games and activities, tricky puzzles, exploration and charming characters. nursery rhymes.

CD /WIN/WIN 95

SOF201 Reader Rabbits's Preschool **$45**

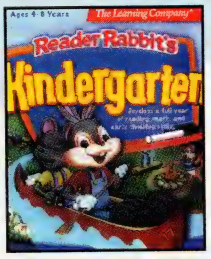
Reader Rabbit's Kindergarten

• Ages 4 to 6

Reader Rabbit's Kindergarten builds early reading, math and thinking skills for children ages four to six years. With interactive activities, puzzles, riddles, rhymes, outrageous animal facts and creativity projects.

CD /WIN/WIN 95 MAC

Designed for Microsoft Windows 95



SOF202 Reader Rabbits's Kindergarten **$45**

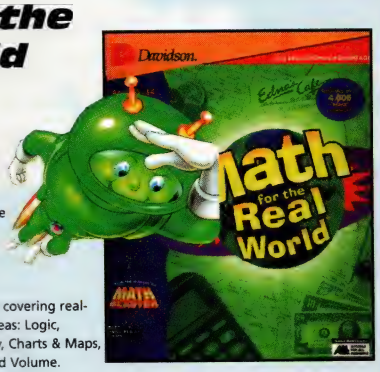
Math for the Real World

• Ages 10 to 14
Grades 5 to 9
Mathematics

Finally a program that shows kids why maths matters! Hit the road with your hot new band on a 10-city tour. Build maths skills and use common sense to help the band climb the charts and earn the chance to produce an amazing multimedia music video!

Includes over 4000 word problems covering real-life maths skills in 9 key subject areas: Logic, Fractions & Decimals, Time, Money, Charts & Maps, Pattern, Weight, Measurement and Volume.

CD /WIN/WIN 95 MAC



SOF203 Maths For The Real World **$65**

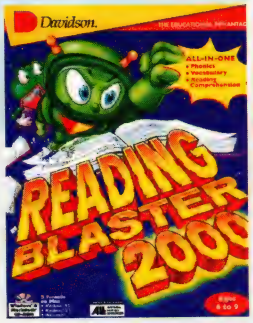
Reading Blaster 2000

• Ages 6 to 9

Join the Blaster Pals and hosts Ike and Rita in The Challenge of the Reading Gladiators, an all-new reading adventure program! Reading Blaster 2000 takes kids through an action-packed, space-age game show that teaches them everything from phonics and vocabulary to spelling and reading comprehension.

CD /WIN/WIN 95
MAC

Designed for Microsoft Windows 95



SOF204 Reading Blaster 2000 ..... **$65**

Choose a Free CD with every order!

1. **MasterClips 1000** — A collection of professional colour clipart
2. **Starfish Internet Utilities** — Manage your diary, contacts, meetings and communications via the internet.
3. **Bodyworks V3** — Learn all about the human body with multimedia guide
4. **TurboCAD V1 Windows** — The most significant release of any CAD software this decade
5. **EZ Language Version 1** — EZ Language V1 is the fun & easy vocabulary pronunciation tutor for 7 different languages
6. **Leonardo the Inventor** — A multimedia exploration of the life works of Leonardo da Vinci. (No 3D glasses)

"Call our friendly, beta testers!!"

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EVERYTHING FOR YOUR PC - DELIVERED NATIONWIDE!

World Book Encyclopedia

Multimedia Encyclopedia

IBM

IBM and World Book have launched the international edition of the new 1997 World Book Multimedia Encyclopedia, linking cutting-edge technology with the world's most authoritative and best-selling reference work to provide the ideal learning resource for school or home. Designed specfically to meet curriculum needs of primary and secondary school students and containing a host of unique features, 1997 World Book Multimedia Encyclopedia is the ideal homework aid and reference work that is easy and fun to use for students, parents and teachers.

This edition includes the entire text of 22 volumes of the International Woro;d Book Encyclopedia and 2-volume dictionary.

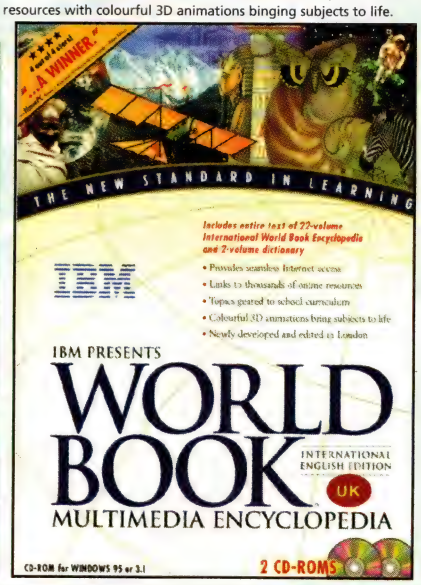
It provides seamless Internet access with links to thousands of online resources with colourful 3D animations binging subjects to life.

Includes Entire Text of 22 Volumes

Provides seamless Internet access. Links to thousands of online services. Newly Developed and edited.

Contains Over 750 maps (including overlays of temperature, terrain and economy)

Time Frame search by year, decade, century, millenium or era



World Book contains:

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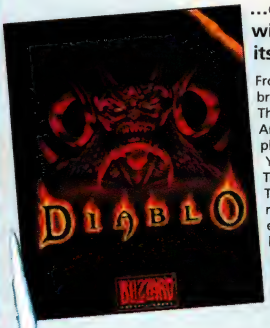

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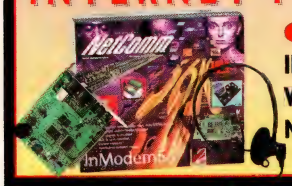

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CODE – SYADE009

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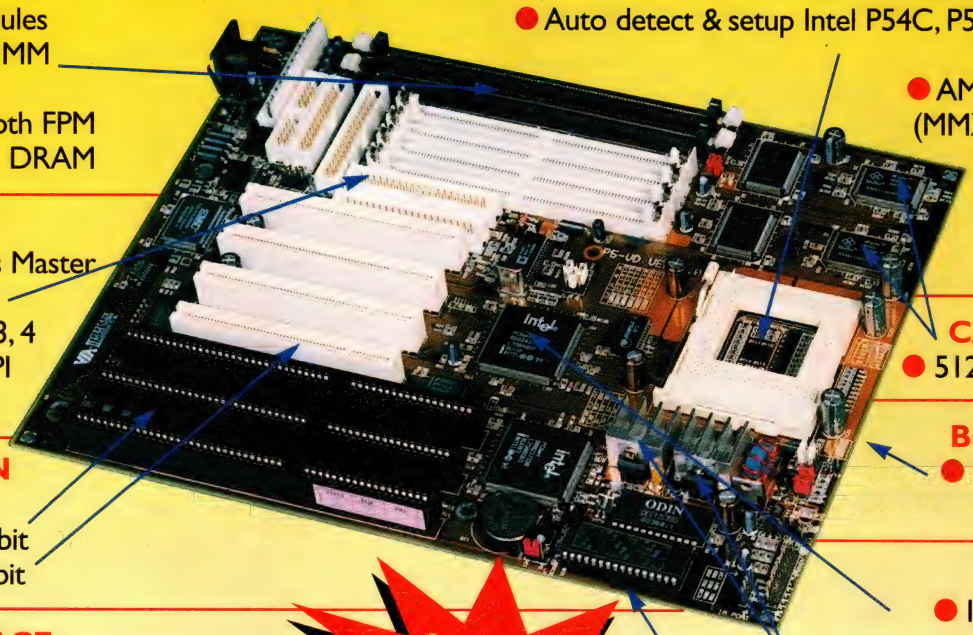

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- Cyrix 686 (M1) & M2 (MMX) Processors

CACHE RAM
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BOARD SIZE
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- AT Form

CHIPSET
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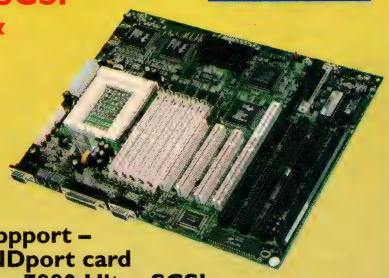

(Code MBDTK003)

CPU
Intel Pentium Pro series up to 200Mhz.
Chipset
Intel 82440FX PCIset.
Architecture RAID Suppport – Adaptec ARO-1330 RAIDport card plus PCI SCSI – Adaptec 7880 Ultra SCSI supports I/O data transfer rates up to 40Mb/s. Performance equivalent to Adaptec AHA-2940 Ultra Wide SCSI Card. PCI Master IDE controller supports PIO Mode 3 & 4 devices, I/O data transfer rate up to 22Mb/s. 4 x 32 bit Master/Slave PCI & 4 x 16 bit ISA slots.
System Memory
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Board
ATX Form.

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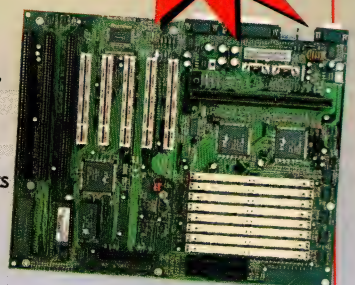
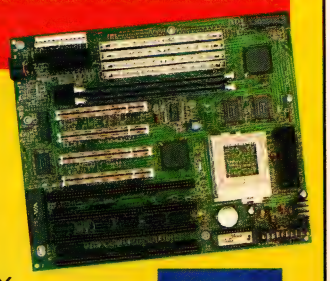
$349



(Code MBDTK004)

CPU
Intel Pentium II up to 266Mhz.
Chipset
Intel 82440FX PCIset
Architecture
PCI Master IDE controller supports PIO Mode 3 & 4 devices, I/O data transfer rate up to 22MB/s. 5 x 32bit Master/Slave PCI & 3 x 16bit ISA slots
System Memory 8 x 72pin simm up to 512MB
System BIOS Award/AMI Board XTX, support flash ROM BIOS, Plug 'n' Play Green Features.

DTK Pentium TX High Performance Mainboard PAM-00571 (Code MBDTK002)



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CPU
Intel Pentium up to 233Mhz, Cyrix686 & M2, AMD, K5, K6, MMX Support.
Chipset
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Architecture PCI Master IDE controller supports PIO Mode 3 & 4 devices, I/O data transfer rate up to 14Mb/s. **Supports "Ultra 33" Synchronous DMA mode transfer rate up to 33Mbytes/sec.** 4 x 32 bit Master/Slave PCI & 4 x 16 bit ISA slots.
System Memory 4 x SIMM Modules, memory config. up to 256Mb supports both FPM and EDO mode DRAM. Supports 32 bit NP 72 pin SIMM and 3.3V SDRAM Configurations up to 256MB. 512K PB Cache On Board.
System BIOS Award/AMI, supports flash ROM BIOS, supports Plug "n" Play.
Board AT Form.

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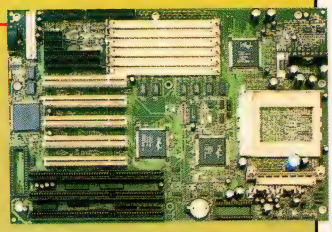
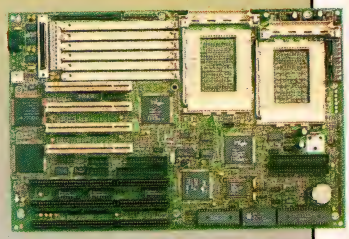


$305

(Code MBDTK000)

CPU
Intel **Pentium Pro** series up to 200Mhz. **Chipset** Intel 82440FX PCIset.
Architecture PCI Master IDE controller supports PIO Mode 3 & 4 devices, I/O data transfer rate up to 22Mb/s. 5 x 32 bit Master/Slave PCI & 3 x 16 bit ISA slots.
System Memory 6 x 72 pin SIMM Modules, memory config. up to 384Mb supports both FPM and EDO mode DRAM.
System BIOS Award/AMI, supports flash ROM BIOS, Green Features.
Board AT Form.

DTK Dual Pentium Pro AT High Performance Mainboard PRM-00321 with SCSI CONTROLLER



$649

(Code MBDTK001)

CPU
Dual Intel Pentium Pro series up to 200Mhz.
Chipset Intel 82440FX PCIset.
Architecture PCI SCSI – Adaptec 7880 Ultra SCSI plus PCI Master IDE controller supports PIO Mode 3 & 4 devices, I/O data transfer rate up to 22Mb/s. 4 x 32 bit Master/Slave PCI & 3 x 16 bit ISA slots.
System Memory 6 x 72 pin SIMM Modules, memory config. up to 384Mb supports both FPM and EDO mode DRAM.
System BIOS Award/AMI, supports flash ROM BIOS, Green Features.
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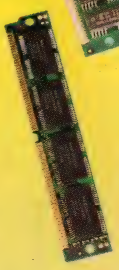

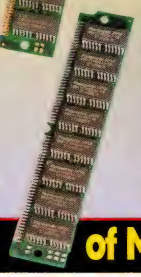

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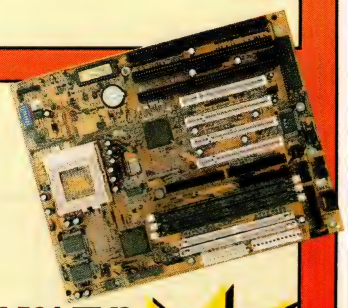
Code	Model	Price
MBGIG002	GA586-DX – 512K cache, Dual CPU MB 75-200Mhz CPU, MMX Support Dual Processor Sockets, RAID Port, Ultra-Wide Adaptec 7880 SCSI controller OnBoard 8-512MB RAM (4 x 72pin SIMM), 4 x PCI, 4 x ISA, ATX Form, Intel HX Chipset	$465
MBGIG003	GA686-NX – 150-200Mhz Pentium Pro CPU, 8-512MB RAM (4 x 72pin SIMM), 4 x PCI, 4 x ISA, PS2 Keyboard & mouse, ATX Form, Intel 82440FX Chipset	$349
MBGIG004	GA686-FX – 150-200Mhz Pentium Pro CPU (Overdrive, MMX), 8-512MB RAM (4 x 72pin SIMM), 4 x PCI, Modem-Ring-ON/Win95-Power-Off, "ACOPS", AT Form, Intel 82440FX Chipset	$349
MBGIG005	GA686-DX – 150-200Mhz Dual Pentium Pro CPU (Overdrive), 8-768MB RAM (6 x 72pin SIMM), 5 x PCI, 3 x ISA, ATX Form, Intel 82440FX Chipset	$545

Code	Model	Price
MBGIG000	GA586-ATV – 512K cache, 75-200Mhz CPU 8-128MB RAM, 4 x PCI, 4 x ISA, AT Form, Intel 430VX Chipset	$169
MBGIG009	GA686-KX PII ATX Single up to 333MH and 6 Simm, 5PC1, 3ISA	$355
MBGIG006	GA586-SVX – 256K cache, CREATIVE VIBRA-16C SoundBlaster OnBoard, 75-200Mhz CPU, MMX Support, 8-128MB RAM, (4 x 72pin SIMM, 1 x 168pin DIMM) 4 x PCI, 4 x ISA, AT Form, Intel 430VX Chipset	$219
MBGIG008	GA586-TX3 – 512K cache, 90-233Mhz CPU, MMX Support, 8-256MB RAM, (2 x 72pin SIMM, 3 x 168pin DIMM) 4 x PCI, 3 x ISA, AT Form, Intel 82430TX Chipset	$215
MBGIG001	GA586-HX – 512K cache, 75-200Mhz CPU, MMX Support, 8-512MB RAM, (4 x 72pin SIMM), 4 x PCI, 4 x ISA, AT Form, Intel HX Chipset	$199



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STORAGE AND BACKUP

HARD DISK DRIVES

Maxtor HD DRIVES

Code	Model	Cap. GB	Seek ms	Motor RPM	Price
HDMAX000	CRYSTAL MAX	1.7	11	4500	$279
HDMAX001	CRYSTAL MAX	2.1	11	4500	$299
HDMAX002	CRYSTAL MAX	3.5	11	4500	$395
HDMAX003	DIAMONDMAX*	2.5	10	5400	$345
HDMAX004	DIAMONDMAX*	5.1	10	5400	$595

Seagate 3.5" EIDE HD DRIVES

Code	Model	Cap. GB	Int.	Seek ms	Motor RPM	Cache	Price
HDSGT001	MEDALIST	2.1	ATA-3	12.5	4500	128K	$315
HDSGT002	MEDALIST	3.2	ATA-2	12.5	4500	128K	$415

Seagate 3.5" ULTRA-SCSI HD DRIVES

Code	Model	Cap. GB	Seek ms	Motor RPM	Cache	Price
HDSGT006	HAWKE 2XL	2.1	9	5400	512K	$799
HDSGT003	BARRACUDA	2.1	9	7200	512K	$1190
HDSGT004	BARRACUDA	4.3	9	7200	512K	$1499
HDSGT005	BARRACUDA	9.1	9	7200	512K	$3890

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Code	Model	Cap. GB	Int.	Seek ms	Motor RPM	Cache	Price
HDQTM008	FIREBALL ST	1.6	U/ATA	10	5400	128K	$295
HDQTM009	FIREBALL ST	3.2	U/ATA	10	5400	128K	$385
HDQTM010	FIREBALL ST	4.3	U/ATA	10	5400	128K	$495
HDQTM011	FIREBALL ST	6.4	U/ATA	10	5400	128K	$675

QUANTUM 3.5" SCSI-3 HD DRIVES

Code	Model	Cap. GB	Seek ms	Motor RPM	Cache	Price
HDQTM007	FIREBALL TM	2.1	10	4500	128K	$475
HDQTM005	ATLAS II	4.5	8	7200	512K	$1450
HDQTM006	ATLAS II	9.1	8	7200	1024K	$2499

FUJITSU EIDE HD DRIVES

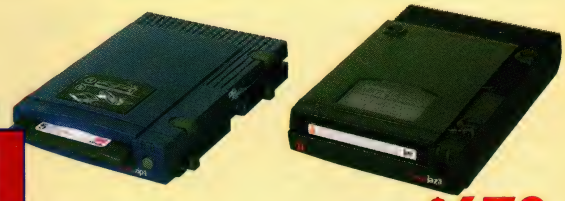
Code	Model	Cap. GB	Price
HDFUJ000	FUJITSU	1.2	$245
HDFUJ001	FUJITSU	1.7	$275
HDFUJ002	FUJITSU	2.1	$295
HDFUJ003	FUJITSU	2.5	$315

FLOPPY DRIVES/DISKETTES

Code	Model	Price
FDSON000	SONY 3.5" 1.44MB FLOPPY DRIVE	$45
FDPAN000	PANASONIC 1.44MB FLOPPY DRIVE	$45
DKGEN000	1.44MB 3.5" DISKETTES (10 PER PACK)	$10
DKGEN001	1.2MB 5 1/4" DISKETTES (10 PER PACK)	$15

IOMEGA PRODUCTS

Code	Model	Price
BUIOM000	ZIP DRIVE EXT. (PARALLEL PORT) – 100MB	$235
BUIOM001	ZIP DRIVE EXT. (SCSI PORT) – 100MB	$235
BUIOM002	ZIP DRIVE INT. 3.5 (INC. SCSI CARD) – 100MB	$235
BUIOM003	JAZ DRIVE (SCSI EXT.) – 1.0GB	$670
BUIOM004	JAZ DRIVE (SCSI INT.) – 1.0GB	$505
BUIOM005	100MB PC ZIP DISKS (3 PER PACK)	$69
BUIOM006	100MB PC ZIP DISKS (10 PER PACK)	$210
BUIOM007	100MB ZIP INT IDE	$235
BUIOM008	JAZ MEDIA 1GB PC DISKS (3 PER PACK)	$465
BUIOM009	JAZ MEDIA 1GB MAC DISKS (3 PER PACK)	$465



iomega

IOMEGA JAZ DRIVE $670

TAPE BACK UNITS

Code	Model	Price
BUSON000	SONY DAT DRIVE 2/4 GB INT.	$1290
BUSON001	SONY DAT DRIVE 4/8 GB INT.	$1350
BUBAC000	BACKPACK 800MB EXT.	$290
BU3M0000	3M TRAVAN TR-1 400/800MB	$245

TAPE CARTRIDGE

Code	Model	Price
BUGEN000	QIC80 DC2120 120MB/250MB COMP	$35
BUGEN001	QIC-3020 MC300XL 680MB/1.36GB COMP	$45
BUGEN002	QIC-WIDE 520 200MB/400MB COMP	$45
BUGEN003	TARVAN TR-1 400MB/800MB COMP	$49
BUGEN004	TARVAN TR-2 800MB/1.6GB COMP	$55
BUGEN005	TARVAN TR-3 1.6GB/2.3GB COMP	$59
BUGEN006	TARVAN TR-4 4GB/8GB COMP	$65
BUGEN007	4MM DAT DDS-1 90M 2GB/4GB COMP	$35
BUGEN008	4MM DAT DDS-2 120M 4GB/8GB COMP	$39

GRAPHICS CARD & MONITORS

DISPLAY CARDS

GENERAL

Code	Model	Price
DCGEN000	1MB TRIDENT ISA SVGA	$49
DCGEN001	1MB (UP TO 2MB) PCI 64Bit EDO DRAM Soft, MPEG, S3 SVGA	$55
DCGEN003	1MB EDO DRAM for S3	$25
DCGEN002	TSENG LABS ET-6000 PCI, SVGA 2MB (UP TO 4MB) MDRAM 128Bit Soft. MPEG	$90
DCGEN004	2MB DRAM for ET-6000	$75

DIAMOND STEALTH

Code	Model	Price
DCDIA000	3D-2000XL 2MB (UP TO 4MB) DRAM 64 BIT	$155
DCDIA001	3D-3000XL 2MB (UP TO 4MB) VRAM 64 BIT	$295
DCDIA002	2MB DRAM UPGRADE FOR 3D CARDS	$45

MATROX

Code	Model	Price
DCMAT000	2MB MYSTIQUE PCI 64Bit 3D/M/MEDIA ACCEL.	$215
DCMAT001	4MB MYSTIQUE PCI 64Bit 3D/M/MEDIA ACCEL. 1280x1024 – 16.7M Col.	$295
DCMAT002	2MB MILLENIUM PCI 64Bit (UPGRADE TO 4 OR 8MB)	$295
DCMAT003	4MB MILLENIUM PCI 64Bit (UPGRADE TO 8MB)	$425
DCMAT004	8MB MILLENIUM PCI 64Bit 'WORLD'S FASTEST'	$695
DCMAT013	4MB MILLENIUM II 220	$450
DCMAT005	2MB for 2MB MATROX BOARDS	$145
DCMAT006	4MB for 4MB MATROX BOARDS	$295
DCMAT007	6MB for 2MB MATROX BOARDS	$395

GRAPHIC ACCELERATORS

Code	Model	Price
MMDIA000	DIAMOND 3D MONSTER 4MB EDO RAM	$365
MMCRE007	CREATIVE 3D BLASTER PCI 4MB	$395
MMCRE008	GRAPHICS BLASTER MA334 4MB M/M ACCEL.	$269

MONITORS

GENERAL

Code	Model	Price
MOGEN000	14" SVGA 0.28DP – 1024x768	$295
MOGEN001	15" SVGA 0.28DP – 1280x1024	$425

MAG

Code	Model	Price
MOMAG001	DX-1495 14" SVGA 0.28DP – 1024x768	$375
MOMAG002	DJ-530 15" XGA 0.28DP – 1280x1024*	$485
MOMAG004	AX-1595 15" XGA 0.28DP – 1280x1024*	$520
MOMAG003	DJ-707 17" XGA 0.26DP – 1280x1024*	$960
MOMAG005	DJ-717 17" CAD 0.26DP – 1600x1280*	$1350
MOMAG006	MX-21F 21" CAD XGA 0.28DP – 1600x1280 *ON SCREEN DISPLAY **MULTIMEDIA & SPEAKERS	$2350

Acer

Code	Model	Price
MOACE001	VIEW 34T 14" N.I DIG. 1024x768	$335
MOACE002	VIEW 54E 15" N.I DIG. 1024x768	$440
MOACE003	VIEW 56E 15" N.I DIG. 1280x1024	$565
MOACE004	VIEW 76IE 17" N.I DIG. 1280x1024	$799
MOACE005	VIEW 78IE 17" N.I DIG. 1600x1200	$995
MOACE006	PRESTIGE 211A 21" N.I DIG. 1600x1200	$2720

NEC

Code	Model	Price
MONEC000	C500 15" SVGA 0.28DP 1024x768 (75Hz)	$565
MONEC001	XV15 15" 1280x1024 CTP	$690
MONEC002	M500 15" MULTIMEDIA	$895
MONEC003	XV17 17" 1280x1024 (75Hz)	$1299
MONEC004	M700 17" MULTIMEDIA	$1550
MONEC005	XP17 17" 1280x1024 (75Hz)	$1880
MONEC006	E1100 21" 1180x1024 (60Hz)	$3250
MONEC007	P1150 21" 1600x1200 (70Hz)	$3995

SONY

Code	Model	Price
MOSON000	CPD-100SF 15" SVGA DIG. M/SCAN TRINITRON	$755
MOSON001	CPD-200SF 17" SVGA DIG. M/SCAN TRINITRON	$1535
MOSON002	CPD-300SF 20" SVGA DIG. M/SCAN TRINITRON	$3150

MULTIMEDIA & INTERNET

CD ROM WRITERS

Code	Model	Price
MMWEA001	WEARNES CDR622 IDE (2X WRITE/ 6X READ)	$895
MMGEN006	COMPRO SCSI (2X WRITE/ 4X READ)	$695
MMGEN003	HP 60201CD SCSI (2X WRITE/ 6X READ)	$1150
MMYAM000	YAMAHA CDR400 SCSI (4X WRITE/ 6X READ)	$1550
MMSAM000	SAMSUNG DVD DRIVER 11.1MB	$575
MMSAM001	SAMSUNG DVD KIT DRIVERWITH M PEG	$1090
MS-ADE005	GENERIC BLANK CDR	$8
MS-KOD000	KODAK GOLD CD	$10

VIDEO CONFERENCE

Code	Model	Price
MMCRE006	CREATIVE VIDEO CONF. KIT CR1140+CR17% TO CR1140+CR1790	$345

CD ROM DRIVES

GENERAL

Code	Model	Price
MMGEN001	GENERIC 12X CDROM DRIVE	$125
MMGEN002	8X SCSI CDROM DRIVE	$265
MMGEN004	12X SCSI CDROM DRIVE	$295
MMCRE002	CREATIVE 12X CDROM DRIVE	$165
MMGEN010	GENERIC 24X CDROM DRIVE	$165
MMCRE003	CREATIVE 16X CD ROM	$175
MMCRE004	CREATIVE 24X CD ROM	$185
MMPAN000	PANASONIC 24X CD ROM DRIVE	$185

Acer

Code	Model	Price
MMACE002	16X CDROM DRIVE (CD616P)	$145
MMACE003	18X CDROM DRIVE (CD616A)	$165
MMACE004	20X CDROM DRIVE (CD920E)	$175
MMACE005	24X CDROM DRIVE	$185

MODEMS

Banksia

Code	Model	Price
FMBAN000	WAVE SP 33.6 D/F/V (SVD)	$249
FMBAN001	MY-VOICE MODEM 33.6/14.4 – V.34	$315

NetComm

Code	Model	Price
FMNET000	ROADSTER ULTRA 33.6 D/F/V (SVD) EXT.	$249
FMNET001	IN-PLUS 33,600 BPS 33.6 D/F/V (SVD) - INT.	$195
FMNET002	CARD-MODEM 33.6 D/F MODEM - PCMCIA	$339
FMNET004	SMART-MODEM 33.6 V34 DES ENCRYPTION	$479
FMNET005	MEMORY MODEM 33.6 D/F/V - EXT.	$468
FMNET006	ROADSTER 56K EXT.	$295

SPIRIT

Code	Model	Price
FMSP100	336L WHITE BOX D/F/V V.34 +	$175
FMSP101	DRAGON 33.6K EXT.	$215
FMSP102	VIPER-96 INT.V.34 33.6 DATA/ 14.4K FAX	$165
FMSP103	COBRA 33.6K + VOICE EXT.	$285
FMSP104	COBRA 33.6K + VOICE INT.	$195
FMSP105	VENTURA 33.6 PCMCIA	$350
FMSP106	SWIFT* - V.32 BIS INT. 14.4 MNP/V.42	$75

*WINFAX LITE FAXMODEM SOFTWARE SUPPLIED.

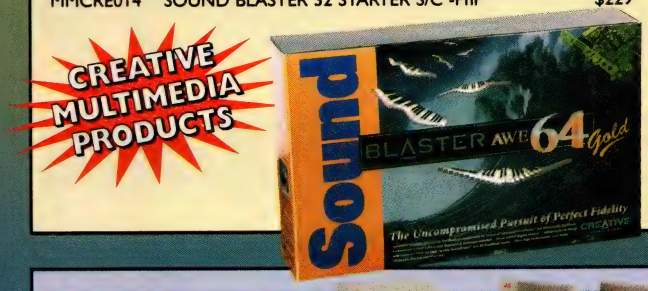
US Robotics

Code	Model	Price
FMROB001	SPORTSTER V.34 EXT.	$199
FMROB002	SPORTSTER V.34+ 33.6 INT. (S/P)*	$195
FMROB004	WORLDPORT V.34+ PCMCIA	$399
FMROB005	COURIER V.34+ 33.6 DATA (U TO 56.6K)	$449
FMROB006	SPORTSTER FLASH EXT 56K	$275

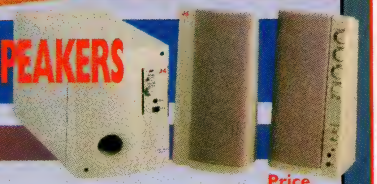
*(S/P) = SPEAKER PPHONE & 56.6K UPGRADABLE

SOUND CARDS

Code	Model	Price
MMGEN005	GENERIC 16 BIT SOUND CARD - PnP	$45
MMCRE011	SOUND BLASTER AWE-64 S/C PnP	$189
MMCRE012	SOUND BLASTER AWE-64GOLD S/C -PnP	$460
MMCRE013	SOUND BLASTER 16 STARTER S/C -PnP	$149
MMCRE014	SOUND BLASTER 32 STARTER S/C -PnP	$229



MICROPHONES & SPEAKERS



JAZZ

Code	Model	Price
MMJAZ000	JAZZ J211 25W SPEAKERS	$30
MMJAZ001	JAZZ J100 100W 3D SPEAKERS	$75
MMJAZ002	JAZZ J200 200W 3D SURROUND SOUND SPEAKERS	$89
MMJAZ003	JAZZ J300 300W 3D SURROUND SOUND SPEAKERS	$95
MMJAZ004	JAZZ 900 SUB WOOFER – 300W	$99
MMJAZ005	JAZZ J903R COMBO – 428W (TWO 128W SATELLITE SPEAKERS + 300W SUB WOOFER)	$145
MMJAZ006	JAZZ J318 50W SPEAKERS WITH BASS BOOST	$65
MMJAZ007	JAZZ SM20 OEM DESKTOP MIC.	$15
MMJAZ008	JAZZ S124 RETAIL DESKTOP MIC.	$20
MMJAZ009	JAZZ HS14 RETAIL STEREO HEADSET & MIC. PACK	$25
MMJAZ010	JAZZ BUNDLE 1 MECH WARRIOR II + ZORK NEMISIS + MIC.	$35
MMJAZ011	JAZZ BUNDLE 2 2 X REMOTE GAME PADS + STREET FIGHTER II TURBO	$55

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CASES AND POWER SUPPLIES

CASES

Code	Model	Price
CAADE000	ADE MINI-TOWER CASE	$65
CAADE010	ADE DELUX MINI-TOWER CASE	$85
CAADE001	ADE DESKTOP CASE	$69
CAADE002	ADE MIDI-TOWER CASE	$95
CAADE003	ADE FULL-TOWER CASE	$139
CAADE004	ADE ATX MID CASE	$135
CAADE005	ADE SERVER FULL TOWER 300W	$195
CAADE006	300W SERVER SQUARE CASE	$295
CAADE007	SCSI EXT. HD CASE	$155
CAADE008	CD ROM EXT. CASE PARRALLEL	$155
CAMAC000	MACASE MINITOWER	$125
CAMAC001	MACASE MID CASE	$195
CAMAC002	MACASE FULL TOWER	$235
CAMAC003	MACASE ATX MINI CASE	$175

POWER SUPPLIES

Code	Model	Price
PSGEN000	200W POWER SUPPLY	$45
PSGEN001	300W POWER SUPPLY	$95
PSGEN002	200W ATX POWER	$55
PSAPC000	APC BACK-UPS 400	$325
PSAPC001	APC BACK-UPS PRO 420	$450
PSAPC002	APC BACK-UPS PRO 650	$530
PSAPC003	APC SMART-UPS 700	$695

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PRINTERS

Canon BUBBLE JET

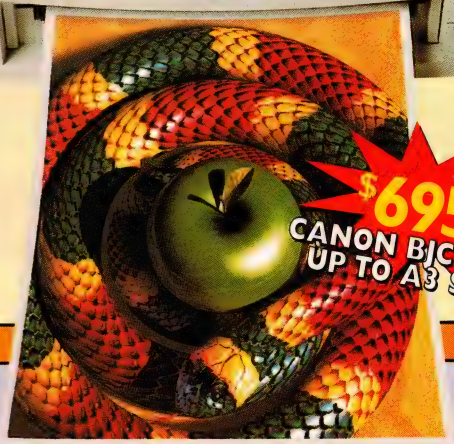
Code	Model	Price
PRCAN000	BJ-30 - B/W A4 720X360 DPI, 277 CPS, PORT.	$285
PRCAN001	BJC-70 - COL.A4 720X360 DPI, 346 CPS, PORT.	$365
PRCAN002	BJC-210 - COL.A4 360X360 DPI, 248 CPS	$245
PRCAN010	BJC-240 - COL.A4 360X360 DPI, 248 CPS PR*	$375
PRCAN003	BJC-4200 - COL.A4 720X360 DPI, 510 CPS PR*	$375
PRCAN004	BJC-620 - COL.A4 720X720 DPI, 300 CPS	$620
PRCAN005	BJC-4550 - COL.A3 720X360 DPI, 510 CPS PR*	$695
PRCAN006	BJ-330 A3 - COL. 360X360 DPI, 600 CPS	$850
PRCAN007	BJC-880 A3 - COL. 360X360 DPI, 300 CPS	$4650

*PR = PHOTO REALISTIC COLOUR QUALITY

Canon

Code	Model	Price
PRCAN009	LBP 1260 ,600 DPI 12PPM PCL5E 250/100 TRAYS 6MB	$2140
PRCAN011	LBP 660,600 DPI 6PPM FAST WINDOWS PRINT	$585

$245 CANON BJC-210



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HEWLETT PACKARD

Code	Model	Price
PRHPD000	PORT 340 , OPT. COL. KIT, 600DPI	$435
PRHPD001	DESKJET 400 OPT. COL. KIT	$279
PRHPD002	DESKJET 670C, 600DPI, COL.	$375
PRHPD003	DESKJET 690C, 600DPI, OPT. COL. PHOTO. KIT	$449
PRHPD004	DESKJET 820CXI, 600DPI, COL. 6PPM	$580
PRHPD005	DESKJET 870CXI, 600DPI, COL. 8PPM, PC/MAC	$754
PRHPD006	DESKJET 1600C, 600DPI, 4X COL. PRO. RESULTS	$2210
PRHPD007	DESKJET 1600CM, 600DPI,4X COL. MAC/PC/N/WORKS	$3225
PRHPD020	HP OFFICEJET PRO 1150C	$1450

Code	Model	Price
PRHPD008	OFFICEJET PRO 350 600DPI COL/SCAN/FAX/COPIER	$1115
PRPHD009	LASERJET 6L, 600DPI, 6PPM, FAST WINDOWS PRINT	$695
PRPHD010	LASERJET 6P, 600DPI, 8PPM, 2MB RAM	$1235
PRPHD011	LASERJET 6MP, 600DPI, 8PPM, PC/MAC *	$1585
PRHPD012	LASERJET 5, 600DPI, 12PPM, 4MB RAM	$2375
PRHPD013	LASERJET 5N, 600DPI, 4MB RAM 10BASE-T	$2750
PRHPD014	LASERJET 5M, 600DPI, MAC/PC/NETWRK *	$3025
PRHPD015	LASERJET 4V, 600DPI, A3 PAPER, 16PPM	$3490
PRHPD016	LASERJET 4MV, 12MB RAM, A3, PC/MAC/NETWK *	$4950
PRHPD017	LASERJET 5SI, 24PPM, TWO BIN	$5065
PRHPD018	LASERJET 5SIMX, 24PPM, TWO BIN	$7770
PRHPD019	LASERJET 5SINX, 24PPM, TWO BIN *	$5459
PRHPD021	HP DESKJET 692C	$439

*DENOTES POSTSCRIPT

$754 HP DESKJET 870Cxi

EPSON

Code	Model	Price
PREPS000	STYLUS COL. 200, 720X360 DPI, 240CPS	$275
PREPS001	STYLUS COL. 400, 720X720 DPI, 3PPM, WIN COMP.	$405
PREPS002	STYLUS COL. 600, 1440X720 DPI, 3PPM, WIN COMP.	$499
PREPS003	STYLUS COL. 800, 1440X720 DPI, 7PPM	$729
PREPS004	STYLUS COL. PRO, 720X720 DPI, 5PPM	$CALL
PREPS005	STYLUS COL. PRO XL, 720X720 DPI FULL BLEED A3	$1915
PREPS007	LQ-570+ 24PIN	$579
PREPS010	STYLUS COL. 1520 1440X720 DPI AZ	$1695

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INPUT DEVICES

KEYBOARDS

GENERAL

Code	Model	Price
IOGEN000	ENHANCED 104/WIN95	$30
IOGEN001	HONEYWELL GENUINE - 104/WIN95	$45
IOMST000	MICROSOFT NATURAL ERGO.- 104/WIN95	$85

Acer

Code	Model	Price
IOACE002	ACCUFEEL 104 KEY GENERIC RUBBER	$35
IOACE000	FUTURE ERGO.WIN95 (with touch pad)	$125
IOACE001	ACER AIR-KEY WIRELESS KEYBOARD	$130

$125 ACER FUTURE ERGO KEYBOARD

MICE

Code	Model	Price
IOGEN004	GENERIC 3 BUTTON MOUSE	$15
IOMST002	MICROSOFT HOME MOUSE	$65
IOMST003	MICROSOFT INTELLI-MOUSE	$95
IOMST004	GENIUS 3 BUTTON MOUSE - SER./PS2	$25
IOLOG000	LOGI-TECH 3 BUTTON DELUXE MOUSE	$35

SCANNERS

GENERAL

Code	Model	Price
IOACE003	ACER 300 A4 COLOUR 4800 DPI	$335
IOACE004	ACER 610 A4 COLOUR H-RES	$595
IOGEN003	OPTICAL A4 COLOUR PARREL	$299
IOUMA000	UMAX ASTRA 600S SCANNER	$539
IOUMA001	UMAX ASTRA 1200S SCANNER	$995

HEWLETT PACKARD

Code	Model	Price
IOHPD000	4S PORTABLE, BLACK AND WHITE, 4 BIT	$299
IOHPD001	5P FLATBED 24 BIT COLOUR 300DPI	$535
IOHPD003	4C FLATBED 30 BIT COLOUR UP TO 2400DPI	$1270

JOYSTICKS & GAME PADS

Code	Model	Price
IOMST005	M/SOFT SIDEWINDER 3D PRO DIG. + GAME	$125
IOMST006	M/SOFT SIDEWINDER ANALOGUE	$79
IOMST007	M/SOFT SIDEWINDER GAME PAD	$75
IOLOG001	L/TECH WINGMAN WARRIOR	$149

NETWORKING

Code	Model	Price
NW3CO000	3COM ETHERLINK III ISA RJ45 3C509B-TPO	$155
NW3CO001	3COM ETHERLINK III ISA 3C509B-COMBO	$205
NW3CO002	3COM ETHERLINK III ISA RJ45/10B5AUI	$185

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NW3CO003	3COM ETHERLINK XLPCI 3C900-TPO	$185
NW3CO004	3COM ETHERLINK XL PCI 3C900-COMBO	$220
NW3CO005	3COM FAST ETHERLINK XL PCI 10/100BT	$185
NW3CO006	3COM FAST ETHERLINK ISA 10/100TX 3C515TX	$265
NW3CO007	3COM PCMCIA ETHERLINK III 3C589D-TP	$229
NW3CO008	3COM PCMCIA ETHERLINK III 3C589D-COMBO	$310
NW3CO009	3COM PCMCIA ETHERLINK III TP/33.6K F/M	$550
NW3CO010	3COM PCMCIA ETHERLINK III COMBO/33.6KF/M	$615
NW3CO011	3COM OFFICECONNECT 4 PORT UNM HUB	$155
NW3CO012	3COM OFFICECONNECT 8 PORT UNM HUB	$245
NW3CO014	3COM OFFICECONNECT 8 PORT HUB 100BASE-TX	$1290
NW3CO015	3COM OFFICECONNECT 16 PORT UNM HUB	$455

OTHER NETWORKING PRODUCTS

Code	Model	Price
NWGEN000	NE2000 COMPATIBLE ISA COMBO	$40
NWGEN001	PCI NETWORK CARD COMBO	$45
NWGEN002	MINI 5 PORT HUB	$85
NWGEN003	GENERIC 8 PORT ETHERNET HUB	$125
NWGEN004	GENERIC 16 PORT HUB	$175
NWGEN005	PCMCIA ETHERNET BNC+RJ45	$175
NWGEN006	POCKET ETHERNET PARRALLEL COMBO	$189
NWGEN009	INTEL ETHEREXPRESS PRO/10 PCI TP (RJ45)	$115
NWGEN010	INTEL ETHEREXPRESS PRO PCI 10/100TX (RJ45)	$145
NWGEN011	ETHERNET TRANCEIVER AUI TO RJ45	$65
NWGEN012	ETHERNET TRANCEIVER AUI TO BNC	$65
NWGEN013	INTEL ETHERNET PRO PCI COMBO 10	$165
NWGEN014	INTEL ETHERNET EXPRESS ISA COMBO 10	$145
NWSMC000	SMC 8432 PCI RJ45	$95
NWSMC001	SMC 8432 PCI COMBO	$125
NWSMC002	SMC 9332 PCI 10/100 TP	$145
NWSMC003	SMC ETHEREZ ISA COMBO	$129
NWXIR000	XIRCOM PCMCIA 10BASE-2 (BNC)	$285
NWXIR001	XIRCOM PCMCIA 10BASE-T (RJ45)	$229
NWXIR002	XIRCOM PCMCIA ETHERNET COMBO	$295
NWXIR003	XIRCOM PCMCIA FAST ETHERNET 10/100TX	$329
NWXIR004	XIRCOM ETHERNET TP/MODEM 33.6K	$495
NWXIR005	XIRCOM ETHERNET COMBO/MODEM 33.6	$595

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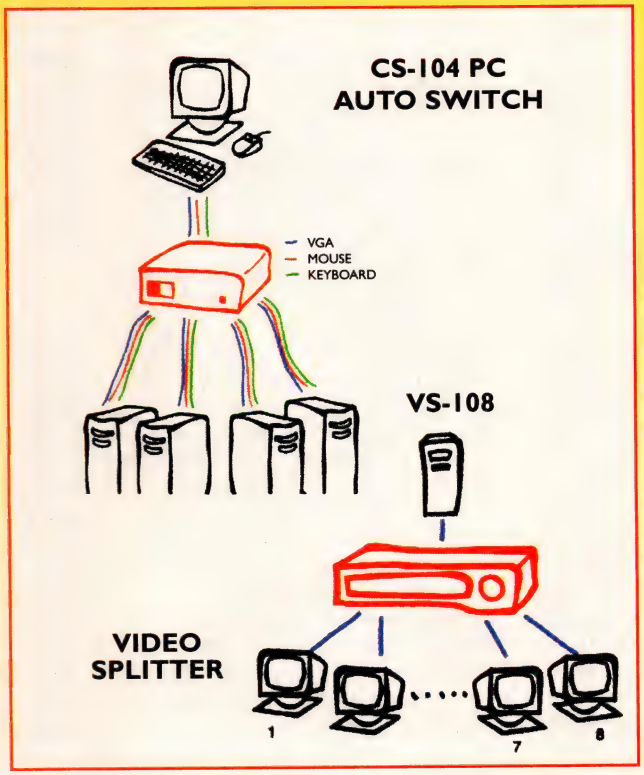
DATA SWITCHES

Item Code	Description	Base/Sales Price
DS-ADE000	VS-102 VIDEO SPLITTER	$79.00
DS-ADE001	VS-104 VIDEO SPLITTER	$115.00
DS-ADE002	VS-108 VIDEO SPLITTER	$155.00
DS-ADE003	SXP-320 OR IC100 BIDIRECTION CONVERTOR	$65.00
DS-ADE004	IC-485 RS232 TO RS485	$65.00
DS-ADE005	IC-162T LINE EXTENDER TR	$50.00
DS-ADE006	IC-162R LINE EXTENDER RV	$50.00
DS-ADE007	MP451 4 TO 1 PRINTER AUTO SW	$35.00
DS-ADE008	AS811P 8 TO 1 PRINTER AUTO SW	$120.00
DS-ADE009	MS-104 MODEM SHARING	$145.00
DS-ADE010	AS402 4 TO 2 PRINTER AUTO SW	$130.00
DS-ADE011	AS-411S SERIAL AUTO SW	$95.00
DS-ADE012	AS-811S SERIAL AUTO SW	$155.00
DS-ADE013	AS-152P BI-D PRINTER AUTO SW	$55.00
DS-ADE014	AS-154P BI-D PRINTER AUTO SW	$65.00
DS-ADE015	AS-415S SERIAL AUTO SW	$45.00
DS-ADE016	SP-200 SERIAL TO PARALLEL CONVERTOR	$55.00
DS-ADE017	PS-200 PARALLEL TO SERIAL CONVERTOR	$55.00
DS-ADE018	IE-488P IEE488 TO CENTRONICS CONVERTOR	$80.00
DS-ADE019	CS-104 PC AUTO SWITCH	$395.00
DS-ADE020	CS-106 PC AUTO SWITCH	$435.00
DS-ADE021	MP201 2 TO 1 PRINTER AUTO SWITCH	$35.00
DS-ADE022	CD-ROM EXTERNAL CASE PARA ECD-108	$164.00
DS-ADE023	MS201N 2 TO 1 SERIAL AUTO SWITCH	$35.00
DS-ADE024	EH132 PORTABLE HARD DISK	$165.00
DS-ADE025	EH100 PORTABLE HARD DISK	$145.00
DS-ADE026	2 TO 1 MANUAL PRINTER SWITCH	$25.00
DS-ADE027	4 TO 1 MANUAL PRINTER SWITCH	$35.00
DS-ADE028	2 TO 1 CPU MANUAL SWITCH	$25.00
DS-ADE029	4 TO 1 CPU MANUAL SWITCH	$35.00
DS-ADE030	CS/02 CPU AUTO SWITCH	$245.00



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CONSUMABLES

EPSON

Item Code	Description	Price
IN-EPS000	SO20002 BLACK FOR SQ850	$79.00
IN-EPS001	SO20003 BLACK FOR EPJ-200	$59.00
IN-EPS002	SO20010 BLACK INK FOR SQ-870, SQ-1170	$59.00
IN-EPS003	SO20025 BLACK FOR STYLUS 400/800/1000	$30.00
IN-EPS004	SO20034 BLACK INK FOR STYLUS COLOUR	$55.00
IN-EPS005	SO20036 COLOUR FOT FOR STYLUS COLOUR	$79.00
IN-EPS006	SO20047 BLACK INK FOR STYLUS 820, IIS	$35.00
IN-EPS007	SO20049 COLOUR FOR STYLUS II, IIS, 1500	$45.00
IN-EPS008	SO20062 BLACK INK FOR STYLUS 1500 XL+	$59.00
IN-EPS009	SO20066 COLOUR INK FOR STYLUS PRO	$85.00
IN-EPS010	SO20089 COLOUR FOR STYLUS 400,600,800,1520	$45.00
IN-EPS011	SO20093 BLACK INK FOR STYLUS C500	$35.00
IN-EPS012	SO20097 COLOUR INK FOR STYLUS C500, 200	$49.00
IN-EPS013	SO20108 BLACK INK FOR STYLUS C800, 1520	$45.00

HEWLETT PACKARD

Item Code	Description	Price
IN-HPD000	HP51633M BLACK FOR HP PORTABLE	$39.00
IN-HPD001	HP51626A BLACK INK FOR HP 500 SERIAL	$39.00
IN-HPD002	HP51629A BLACK INK FOR 600 SERIAL	$39.00
IN-HPD003	HP51645A BLACK INK FOR HP850C/1600	$39.00
IN-HPD004	HP51640A BLACK INK FOR DJ1200 SERIAL	$39.00
IN-HPD005	HP51606A BLACK INK FOR HP PAINTJET XL	$45.00
IN-HPD006	HP51639A BLACK INK FOR PAINTJET XL300	$39.00
IN-HPD007	HP51625A COLOUR FOR DJ500 SERIAL	$44.50
IN-HPD008	HP51649A COLOUR INK FOR 600 SERIAL	$44.50
IN-HPD009	HP51641A COLOUR FOR DESKJET 850C/890C	$45.00
IN-HPD010	HP51640C CYAN INK FOR DJ1200/1600 SERIAL	$44.50
IN-HPD011	HP51640M MAGENTA INK FOR DJ1200/1600 SERIAL	$44.50
IN-HPD012	HP51640Y YELLOW INK FOR DJ1200/1600 SERIAL	$44.50
IN-HPD013	HP COLOUR PHOTO KIT FOR HP690C	$79.00
IN-HPD014	HP PHOTO COLOUR CARTRIDGE	$49.00

Canon

Item Code	Description	Price
IN-CAN000	BC01 BLACK INK FOR BJ10/20 SERIAL	$39.00
IN-CAN001	BC02 BLACK INK FOR BJ200/230/BJC210/240	$39.00
IN-CAN002	BC05 COLOUR INK FOR BJC210/240	$49.00
IN-CAN003	BC06 PHOTO INK FOR BJC240	$49.00
IN-CAN004	BC06KIT PHOTO COLOUR KIT FOR BJC240	$65.00
IN-CAN005	BC09F FLUORESCENT INK FOR BJC210/240	$79.00
IN-CAN006	BC10 BLACK INK & HEAD FOR BJ30/BJC70	$55.00
IN-CAN007	BCI10BK BLACK INK FOR BJ30/BJC70	$25.00
IN-CAN008	BC11 COLOUR INK & HEAD FOR BJC70	$65.00
IN-CAN009	BCI11BK BLACK INK FOR BJC70 (3 PACK)	$19.00
IN-CAN010	BCI11C COLOUR INK FOR BJC70 (3 PACK)	$35.00
IN-CAN011	BC20 BLACK INK & HEAD FOR BJC4000 SERIAL	$49.00
IN-CAN012	BC21 COLOUR & BLACK INKHEAD BJC4000 SERIAL	$75.00
IN-CAN013	BCI21BK BLACK INK FOR BJC4000 SERIAL	$15.00
IN-CAN014	BCI21C TRI-COLOUR FOR BJC4000 SERIAL	$29.00
IN-CAN015	BC22 PHOTO INK FOR BJC4200/4500	$75.00
IN-CAN016	BC22KIT PHOT KIT FOR BJC4200/4550	$95.00
IN-CAN017	BC29F FLUORESCENT INK FOR BJC4000 SERIAL	$75.00
IN-CAN018	BJI201B BLACK INK FOR BJC600 SERIAL	$25.00
IN-CAN019	BJI201C CYAN INK FOR BJC600 SERIAL	$15.50
IN-CAN020	BJI201M MAGENTA INK FOR BJC600 SERIAL	$15.50
IN-CAN021	BJI201Y YELLOW INK FOR BJC600 SERIAL	$15.50
IN-CAN022	BJI642 BLACK INK FOR BJ300/330	$29.00
IN-CAN023	BJI643BK BLACK INK FOR BJC800/880	$45.00
IN-CAN024	BJI643C CYAN INK FOR BJC800/880	$49.00
IN-CAN025	BJI643M MAGENTA INK FOR BJC800/880	$49.00
IN-CAN026	BJI643Y YELLOW INK FOR BJC800/880	$49.00
IN-CAN027	BJI801 INK FOR BJ80	$35.00

TONER CARTRIDGES

Item Code	Description	Price
TO-EPS000	EPSON EPL4000/4200 TONER SO50002	$235
TO-EPS001	SPEON EPL5500 TONER SO50005	$115
TO-EPS002	EPSON EPL7100/75400/800/7500 SO51009	$450
TO-EPS003	EPSON EPL3000 CARTRIDGE SO51020	$230
TO-EPS004	EPSON EPL5000/EPL5200 CARTR SO51011	$305
TO-HPD000	HP LASERJET II/III TONER HP92295A	$125
TO-HPD001	HP LASERJET 4L/4ML/4P/4MP TONER HP92274A	$115
TO-HPD002	HP LASERJET 5L TONER HP-C3906A	$99
TO-HPD003	HP LASERJET IIP/IIIP/IIIP+ TONER 92275A	$149
TO-HPD004	HP LASERJET 4SI/4SI MX/3SI TONER 92291A	$220
TO-HPD005	HP LASERJET 5SI/5SI MX TONER HP-C3909A	$325
TO-HPD006	HP LASERJET 4/4M/5/5N/5M TONER HP 92298Z	$165
TO-HPD007	HP LASERJET 4V/4MV TONER HP-C3900A	$275
TO-HPD008	HP LASERJET 5P/5MP/6P/6MP TONER	$130
TO-OKI000	OKI OL400E/410E/810E TONER	$39

CABLES

Item Code	Description	Price
CB-GEN000	6FT PRINTER CABLE DB25/CENTRONIC	$5.00
CB-GEN001	3 METERS PRINTER CABLE	$9.00
CB-GEN002	5 METERS PRINTER CABLE	$12.00
CB-GEN003	10 METERS PRINTER CABLE	$19.00
CB-GEN004	20 METERS PRINTER CABLE	$25.00
CB-GEN005	3 METERS 25 WIRE MOLDED PRINTER CABLE	$10.00
CB-GENO88	IEEE PRINTERCABLE 1.8M	$19.00
CB-GEN006	1.8M 9F/25M MODEM CABLE	$10.00
CB-GEN007	1.6M 9F/25M/25F MODEM CABLE	$15.00
CB-GEN008	1.8M SERIAL DB25M/DB25M	$9.00
CB-GEN009	3M SERIAL DB25M/DB25M	$15.00
CB-GEN010	5M SERIAL DB25M/DB25M	$17.00
CB-GEN011	10M SERIAL DB25M/DB25M	$20.00
CB-GEN012	20M SERIAL DB25M/DB25M	$25.00
CB-GEN013	1.8M SERIAL DB25M/DB25F	$9.00
CB-GEN014	3M SERIAL DB25M/DB25F	$12.00
CB-GEN015	5M SERIAL DB25M/DB25F	$15.00
CB-GEN016	10M SERIAL DB25M/DB25F	$17.00
CB-GEN017	20M SERIAL DB25M/DB25F	$25.00
CB-GEN018	1.8M DB25F/DB25F	$9.00
CB-GEN019	3M SERIAL DB25F/DB25F	$12.00
CB-GEN020	5M SERIAL DB25F/DB25F	$17.00
CB-GEN021	10M SERIAL DB25F/DB25F	$20.00
CB-GEN022	20M SERIAL DB25F/DB25F	$25.00
CB-GEN023	1.8M KEYBOARD EXTENSION M/F	$9.00
CB-GEN024	3M KEYBOARD EXTENSION M/F	$12.00
CB-GEN025	5M KEYBOARD EXTENSION M/F	$15.00
CB-GEN026	1.8M CURLY KEYBOARD EXTENSION M/F	$10.00
CB-GEN027	1.8M PS/2 KEYBOARD EXTENSION M/F	$12.00
CB-GEN028	1.8M PS/2 KEYBOARD M/M	$12.00
CB-GEN029	1.8M KEYBOARD CABLE M/M	$10.00
CB-GEN030	1.8M EGA OR MOUSE EXTENSION 9F/9M	$9.00
CB-GEN031	1.8M EGA OR MOUSE CABLE 9M/9M	$9.00
CB-GEN032	1.8M VGA EXTENSION 15M/15F	$9.00
CB-GEN033	3M VGA EXTENSION 15M/15F	$15.00
CB-GEN034	5M VGA EXTENSION 15M/15F	$17.00
CB-GEN035	1.8M VGA MONITOR CABLE 15M/15M	$9.00
CB-GEN082	5M MONITOR CABLE HD15M/HD15M	$17.00
CB-GEN036	MONITOR SPLITTER CABLE 15M/15F*2	$15.00
CB-GEN037	1.8M RGB MONITOR CABLE 15M/BNC*5	$25.00
CB-GEN038	1.8M PARALLEL DB25M/M	$12.00
CB-GEN039	5M PARALLEL LAPLINK DB25M/M	$15.00
CB-GEN040	10M LAPLINK PARALLEL DB25M/M	$19.00
CB-GEN041	3M LAPLINK SERIAL DB25F/DB9F-DB25F/DB9F	$15.00
CB-GEN042	1M CENT50M TO CENT50M SCSI	$15.00
CB-GEN043	1.8M CENT 50M CENT 50M SCSI	$17.00

Item Code	Description	Price
CB-GEN044	1M CENT 50M/DB25M SCSI	$15.00
CB-GEN045	CENT 50M SCSI TERMINATOR ACTIVE	$25.00
CB-GEN046	CENT 50M TERMINATOR/CENT 50M/CENT 50F	$19.00
CB-GEN047	1M HONDA 50M/CENT 50M SCSI II	$25.00
CB-GEN048	1.8M HONDA 50M/CENT 50M SCSI II	$29.00
CB-GEN049	1M HONDA 50M/DB25 SCSI II	$25.00
CB-GEN050	1M HONDA 50M/HONDA 50M SCSI II	$39.00
CB-GEN051	1M HONDA 68M/HONDA 68M SCSI III	$45.00
CB-GEN052	1M HONDA 68M/HONDA 50M SCSI III/SCSI II	$45.00
CB-GEN053	1M HONDA 68M/CENT 50M	$45.00
CB-GEN054	HONDA 50M TERMINATOR ACTIVE	$25.00
CB-GEN055	HONDA 68M TERMINATOR ACTIVE	$39.00
CB-GEN 083	HONDA 68 TO DB25 M SC III	$45.00
CB-GEN056	INTERNAL TERMINATOR ACTIVE	$20.00
CB-GEN057	INTERNAL SCSI III	$85.00
CB-GEN058	FLOPPY CABLES 780MM 5 CONNECTORS	$6.00
CB-GEN059	IDE CABLE 3 CONNECTORS	$6.00
CB-GEN060	INTERNAL SCSI 7 CONNECTOR	$15.00
CB-GEN061	INTERNAL POWER SPLITTER	$5.00
CB-GEN062	1.8M WALL TO PC POWER CABLE	$6.00
CB-GEN063	1.8M PC TO MONITOR POWER CABLE	$7.00

NETWORKING

Item Code	Description	Price
CB-GEN064	2M COAXIAL CABLE WITH BNC CONNECTORS	$9.00
CB-GEN065	5M COAXIAL CABLE WITH BNC CONNECTORS	$12.00
CB-GEN066	10M COAXIAL CABLE WITH CONNECTORS	$15.00
CB-GEN067	20M COAXIAL CABLE WITH CONNECTORS	$20.00
CB-GEN068	30M COAXIAL CABLE WITH CONNECTORS	$25.00
CB-GEN069	50M COAXIAL CABLE WITH CONNECTORS	$35.00
CB-GEN070	BNC TERMINATOR	$3.50
CB-GEN071	BNC T CONNECTOR	$3.50
CB-GEN072	1M RJ45 CABLE	$8.00
CB-GEN073	2M RJ45 CABLE	$10.00
CB-GEN074	5M RJ45 CABLE	$15.00
CB-GEN075	8M RJ45 CABLE	$19.00
CB-GEN076	10M RJ45 CABLE	$20.00
CB-GEN077	15M RJ45 CABLE	$25.00
CB-GEN078	20M RJ45 CABLE	$30.00
CB-GEN079	25M RJ45 CABLE	$35.00
CB-GEN080	30M RJ45 CABLE	$39.00
CB-GEN081	40M RJ45 CABLE	$45.00
CB-GEN084	2 METRE RJ45 CABLE-CROSS OVER	$12.00
CB-GEN085	3 METRE RJ45 CABLE-CROSS OVER	$15.00
CB-GEN086	5 METRE RJ45 CABLE-CROSS OVER	$19.00
CB-GEN087	10 METRE RJ45 CABLE-CROSS OVER	$25.00

ADE AUSTRALIA

SOFTWARE

Code	Model	Price
SWMST000	MICROSOFT WIN95 ON DISK-NEW USER	$275
SWMST001	MICROSOFT WIN95 ON CD -UPGRADE	$139
SWMST002	MICROSOFT WIN95 ON DISKETTE -UPGRADE	$139
SWMST003	MICROSOFT WIN NT WORKSTATION 4.0 -NEW USER	$399
SWMST004	MICROSOFT WIN NT WORKSTATION 4.0 -UPGRADE	$189
SWMST005	MICROSOFT OFFICE 97 STD VERS.CD -NEW USER	$629
SWMST006	MICROSOFT OFFICE 97 STD VERSI.CD -UPGRADE	$345
SWMST007	MICROSOFT OFFICE 97 PRO VERS. CD -NEW USER	$759
SWMST008	MICROSOFT OFFICE 97 PRO VERS. CD -UPGRADE	$439
SWMST009	MICROSOFT WORKS VER 4.0 FOR WIN95	$95
SWMST010	MICROSOFT WORD 97 -NEW USER	$319
SWMST011	MICROSOFT WORD 97 -UPGRADE	$139
SWMST012	MICROSOFT EXCEL 97 -NEW USER	$299
SWMST013	MICROSOFT EXCEL 97 -UPGRADE	$139
SWMST014	MICROSOFT POWER POINT 97 -NEW USER	$319
SWMST015	MICROSOFT POWER POINT 97 -UPGRADE	$139
SWMST016	MICROSOFT ACESS 97 -NEW USER	$319
SWMST017	MICROSOFT ACESS 97 -UPGRADE	$139
SWMST018	MICROSOFT PUBLISHER 97 -NEW USER	$95
SWMST019	MICROSOFT PUBLISHER 97 -UPGRADE	$95
SWMST020	MICROSOFT FRONT PAGE 97 -NEW USER	$139
SWMST021	MICROSOFT FRONT PAGE 97 -UPGRADE	$65
SWMST022	MICROSOFT OUTLOOK 97	$129
SWMST023	MICROSOFT VISUAL J++	$149
SWMST024	MICROSOFT VISUAL C++ PRO V5	$650
SWMST026	MICROSOFT ENCARTA 97 I/ACTIVE ENCYCLOPEDIA	$59
SWMST027	MICROSOFT ENCARTA 97 I/ACTIVE WORLD ATLAS	$59
SWMST028	MICROSOFT PICTURE IT!	$99
SWMST029	MICROSOFT GREETING WORKSHOP	$35
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SWMST033	MICROSOFT 3D MOVIEMAKER	$49
SWMST034	MICROSOFT NEVERHOOD	$59
SWMST035	MICROSOFT GOOSEBUMPS	$49
SWMST036	MICROSOFT NBA FULL COURT PRESS	$59
SWMST037	MICROSOFT GOLF V3	$59

Code	Model	Price
SWMST038	MICROSOFT FOOTBALL	$59
SWMST039	MICROSOFT MONSTER TRUCK MADNESS	$59
SWMST040	MICROSOFT HELLBENDER	$59
SWMST041	MICROSOFT DEADLY TIDE	$59
SWMST042	MICROSOFT FLIGHT SIMULATOR	$59
SWMST043	MS OFFICE 97 VALUE PACK	$499
SWMST044	MS PROJECT WIN 95 DISK	$590
SWMST048	MS WIN NT SERVER V4 5 USER	$890
SWMST051	MS HOME ESSENTIAL 97	$149
SWMST052	MS OFFICE 97 SMALL BUSINESS ED	$355
SWMYO000	M.Y.O.B FIRST ACCOUNTS	$259
SWMYO001	M.Y.O.B ACCOUNTING	$335
SWMYO002	M.Y.O.B ACCOUNTING WITH PAYROLL	$555
SWMYO003	M.Y.O.B PREMIER 3 USERS	$875
SWLOT000	LOTUS SMART SUITE 97 - NEW USER	$799
SWLOT001	LOTUS SMART SUITE 97 - UPGRADE	$345
SWTRA000	TRACKER 2.0	$379
SWTRA001	TRACKER UPGRADE / CROSSGRADE TO 2.0	$169
SWMAS001	MASTER PLAN FOR WIN LVL 2 - PROFESSIONAL	$189
SWSYM000	SYMANTEC ACT! 3.0 (WIN 95/NT/3.5")	$249
SWSYM001	SYMANTEC ACT! 2.0 (WIN 3.1 3.5")	$315
SWSYM002	SYMANTEC INTERNET FAST FIND	$65
SWSYM003	SYMANTEC WINFAX PRO 7.5	$125
SWSYM004	SYMANTEC PC ANYWHERE 32 7.5	$209
SWSYM005	SYMANTEC NORTON 4 YOUR EYES 4.0 WIN95 3.5	$125
SWSYM006	SYMANTEC NORTON 4 YOUR EYES 4.0 10 USER WIN 95	$955
SWSYM007	SYMANTEC NORTON ANTI VIRUS -WIN95	$85
SWSYM008	SYMANTEC NORTON UTILITIES	$109
SWSYM009	SYMANTEC HEALTHY PC	$39
SWSYM010	SYMANTEC PC HANDY MAN FOR WIN95	$69
SWQIK003	QUICKEN FAMILY LAWYER CD	$45
SWQIK004	QUICKEN PAYROLL PRO V3.0	$350
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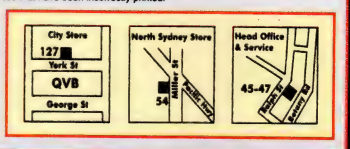

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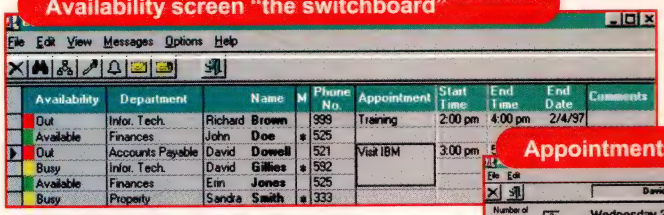

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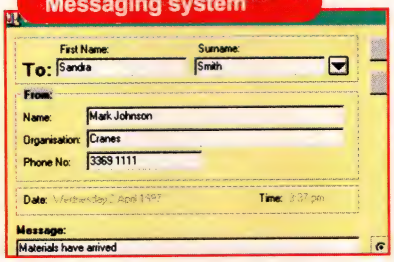

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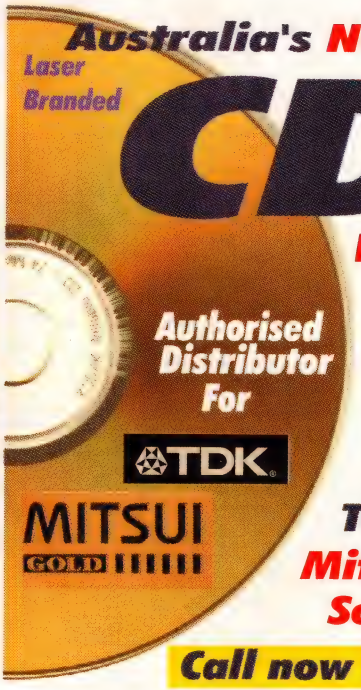

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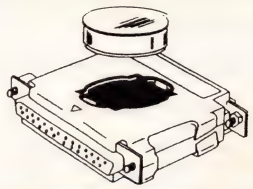

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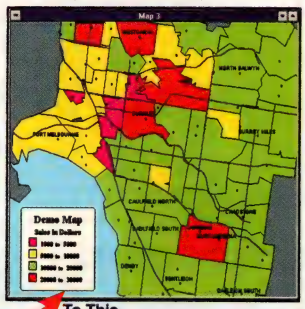

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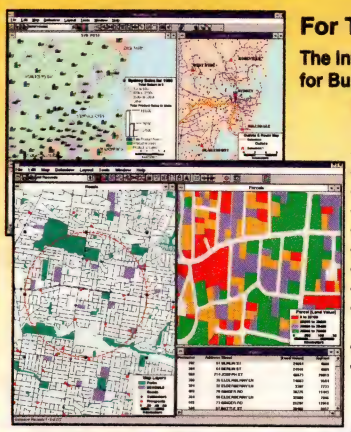

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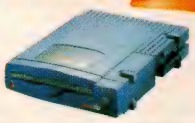

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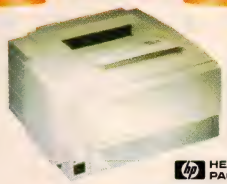

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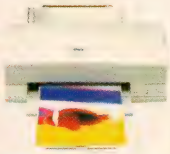

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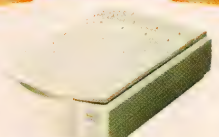

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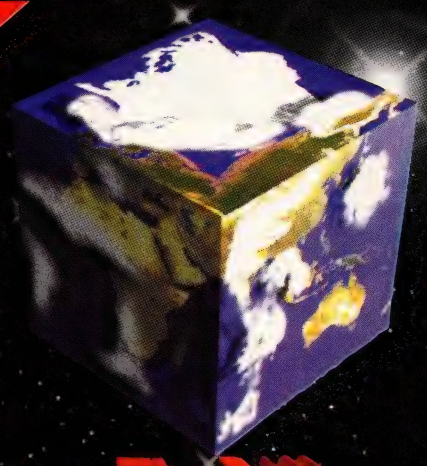

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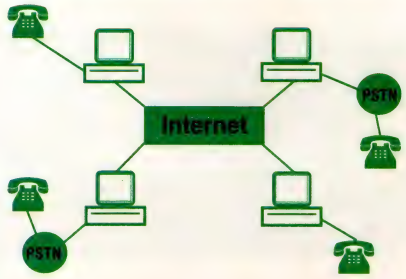

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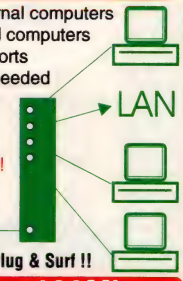

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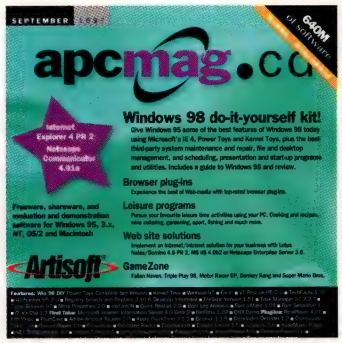
- To provide fast, easy access to the files and resources we talk about in *APC* and to save you download time and money;
- To make it easy for our readers to get on the Internet so they can use our new interactive Web site.

The kit contains browsers, file-transfer programs, Mail and News readers and much more for each of the major operating systems. To make it as easy as possible for readers to get online, we've also included reader offers and a sign-up kit.



apcmag.cd aims to complement both the magazine and *APC*'s Web site. The concept is simple: when you read about a program in the magazine, such as a piece of software from a Shareware column, you need only insert apcmag.cd, browse it with your favourite WWW browser, and download the file directly from the CD. Articles which include related items on the CD are identified by the ◉ symbol at the top of the page. Each piece of software includes instructions on whether you will need to unzip the file before installing it; most also include Readme files.

Using the CD

Everything you need to use **apcmag.cd** has been created in HTML. You don't need any special software to access the disc, other than a standard browser, and it will work on most common platforms.

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The CD has been tested using Netscape Navigator 3.0 and 4.0, and MS Internet Explorer 3.0.

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Instructions on 'How to Enter' form part of the Conditions of Entry of all competitions in *APC* September. Entry is free and open to all residents of Australia other than employees of ACP Publishing Pty Ltd (ACN 053 273 546), suppliers of competition prizes, their families and associated agencies.

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Prizewinners will be notified by security post and their names published in the December issue of *APC*.

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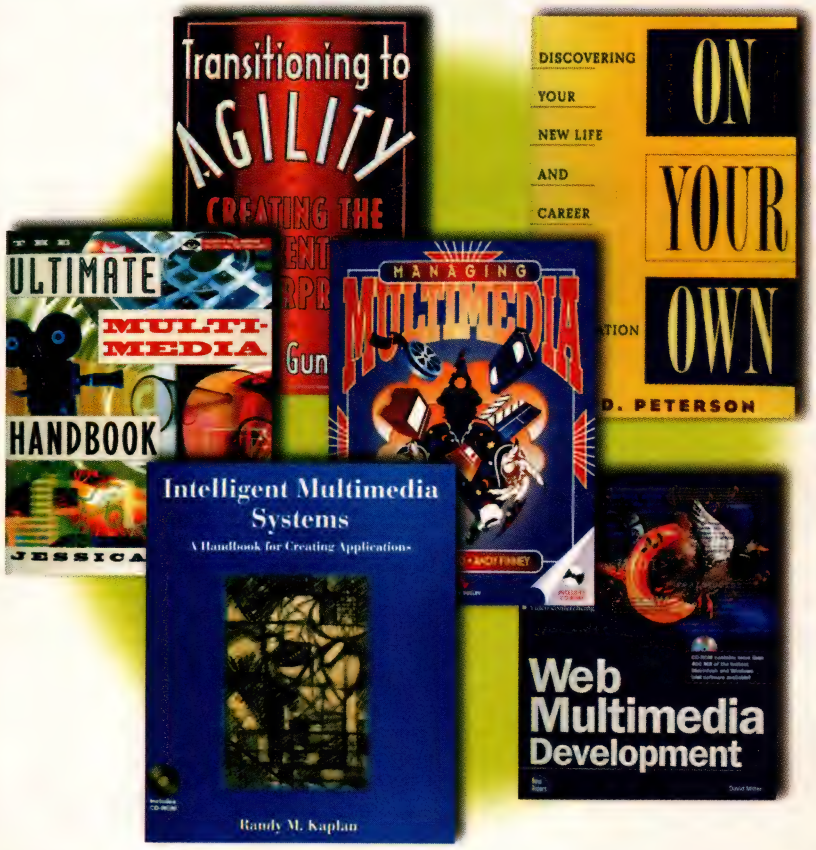
Exploring multimedia



Intelligent Multimedia Systems

The combination of artificial intelligence and multimedia is a compelling idea, but is more often a part of a 'Star Trek'-style future than an articulated plan. Author Randy Kaplan provides a practical demonstration of how these two computing strands can be combined. He explains interactive multimedia development using a 'home-brewed' language called IL, as well as Authorware, Director and Visual Basic. Similarly, AI concepts are developed using Small-X and the established languages LISP and Prolog. The use of private languages seems strange at first, but their relative simplicity makes it easier to follow the concepts without getting bogged in the complexities of 'real' languages. The book provides a theoretical background, so it can be relatively heavy going at times, and there are plenty of references if you want to delve further into any particular topic.

The two threads are brought together to create the Toaster Tutor, a system for teaching toaster repair. This program implements three separate models: one represents the toaster itself (how it works and what can go wrong), another mirrors the student's mental model of how a toaster works (by drawing inferences from the student's actions in attempting to fix a fault), and an instructional model provides appropriate suggestions when the student's actions suggest a lack of knowledge (of toaster components, the mechanism's operation or problem-solving strategies).

The accompanying CD-ROM provides Visual Basic source code for the examples, plus sample applications created using Director and Authorware. Kaplan also looks at natural language processing in the context of multimedia applications, considers the use of neural networks (to represent the student and instructional models in Toaster Tutor, for example) and genetic programming (for example, so the Tutor could solve the class of problems it presents), virtual reality and the delivery of intelligent multimedia systems via the Internet.

If we are lucky, Kaplan's readers will create a variety of powerful and useful applications.

Stephen Withers

Author	Randy M Kaplan
Publisher	John Wiley & Sons
Distributor	Jacaranda Wiley
Phone	(02) 9805 1100
Price	$89.95
ISBN	0-471-12040-5
Rating	★★★☆

Managing Multimedia

This is a singularly unprepossessing book. The cover looks like a 1960s Rolling Stones album cover, the illustrations inside look like the worst visitations of the clip art library, and the bundled CD-ROM is really just an HTML version of the book itself. All this is a shame, because this is probably one of the best books available on multimedia and Web production in print right now. *Managing Multimedia* deals with real issues such as how much to spend, how to choose pro-

grammers, and how to bring a project in on time. The authors are both ex-BBC and design people, and their pedigrees show. There are extensive 'Theory into Practice' sections that point out realities such as objectives, user demographics, time allocation, and project management, as well as the best ways to use video, sound and animation across a wide range of delivery mechanisms. The book does lack some of the glossy, tip-ridden layout that many computer books offer, but in terms of real and useful content it is a solid read. The other useful aspect is that it doesn't just concentrate on programming. It also offers advice on how to shoot video, how to record to best effect, how to compress data with minimal perceived quality loss and how to get the best out of a professional voice-over artist.

Several sample job sheets are provided which allow a potential producer to track and maintain progress with the least confusion. The setup and enforcement of freelance artist and programmer contracts are covered, together with details of JPEG compression, anti-aliasing and digital sound formats. If you can ignore the cover and illustrations, this book is an excellent reference for the newcomer to multimedia production and programming.

Jeremy Torr

Author	Elaine England and Andy Finney
Publisher	Addison Wesley
Distributor	Addison Wesley Longman
Phone	(03) 9697 0666
Price	$57.95
ISBN	0-201-87739-2
Rating	★★★★

In short

Business Multimedia Explained

This guide identifies and explains 180 of the key terms, concepts, products and corporate players in multimedia. It clarifies the business implications of multimedia for those who must make investment decisions.

Author	P Keen
Publisher	Harvard Business School
Distributor	McGills
Phone	(03) 9602 5566
Price	$49.95
ISBN	0-87584-772-2

Designing Multimedia Environments for Children

This book shows you how to create vibrant multimedia environments for children. It offers a historic overview of children's software development, explores the latest technologies, then provides examples of effective multimedia environments.

Author	A Drum and C Solomon
Publisher	Jacaranda Wiley
Distributor	Jacaranda Wiley
Phone	(02) 9805 1100
Price	$76.95
ISBN	0-471-11688-2

Java Multimedia Cyber Classroom

This is a comprehensive introduction to the Java programming language for individuals with no prior computer programming experience.

Author	H Deitel
Publisher	Prentice Hall
Distributor	Prentice Hall Australia
Phone	(02) 9939 1333
Price	$99.95
ISBN	0-13271-974-6

Mainstream Videoconferencing: A Developer's Guide to Distance Multimedia

Managers or technical professionals developing products for this rapidly emerging industry will find this book helpful. It helps readers attain a thorough understanding of the underlying technology, evaluate current and future systems, and create strategies on potential use. There is a detailed look at the technology.

Author	J Duran and C Sauer
Publisher	Addison-Wesley
Distributor	McGills
Phone	(03) 9602 5566
Price	$39.95
ISBN	9-780201-847475

Managing Multimedia

Managing Multimedia is a guide for multimedia producers, covering every stage of the management process from initial client meeting to delivery of the finished product.

Author	E England and A Finney
Publisher	Addison-Wesley
Distributor	Addison Wesley Longman
Phone	(03) 9697 0666
Price	$57.95
ISBN	0-201-87739-2

Multimedia Information Resources

With a strong Australian orientation, this book provides practical guidelines for librarians and educators for developing, organising and managing a multimedia collection. Chapters cover general issues such as collection development, bibliographic organisation, storage, user access, hardware and copyright. It also examines specific media, including technologies that evolved over the past decade.

New Media Pricing Guide

This guide covers the subjects of proposals, budgets and pricing for new media. According to the publisher, no other book currently available does this in detail. Caveat emptor: as it is published in the US, some advice may not be relevant in Australia.

Author	F Szabo
Publisher	Prentice Hall
Distributor	Prentice Hall Australia
Phone	(02) 9939 1333
Price	$69.95
ISBN	1-5683-0336-X

Programming with Objects Multimedia and C++

This title comes with a storybook and software included. The storybook is a sequence of informal, fictional tales that discuss the concepts found in the text. The software component teaches readers how to write their own C++ programs using the C++ compiler on their machine. It also provides complete coverage of object oriented programming which teaches readers to program for multimedia.

Author	D Franca
Publisher	Jacaranda Wiley
Distributor	Jacaranda Wiley
Phone	(02) 9805 1100
Price	$80.95
ISBN	0-471-131-377

Perspective: On Your Own

Downsizing and rationalisation seem to be constant threats to employment and financial security. Management consultant and author Carl Peterson outlines his principles for those searching for or forced to investigate options outside the corporate arena. *On Your Own* is not full of motivational anecdotes, nor is it only for those who find themselves unemployed after years of loyal service. Rather, Peterson aims to help those in mid-career explore their wealth of accumulated knowledge and experience. He believes that in order to survive in a forever changing climate, you need to determine where you want to go, and who you want to become, which will ultimately lead to the right career. After you have answered these questions you can mould your existing experience with newly developed skills and knowledge to make yourself more valuable to your chosen employer. In chapter two, 'Reinventing Yourself as Your Own Personal Enterprise', Peterson suggests that assessing your skills and developing your 'personal enterprise' is fundamental for advancing your career or becoming self-employed. The objective is to treat yourself as a business, constantly adding to the value of the corporation through the acquisition of new skills and experiences.

The bulk of the book is aimed at those with a desire to be their own boss. The author explores four key areas: starting a business, buying a business, buying a franchise, and forming a consultancy. This section is presented in a logical, step-by-step format complete with useful tables, worksheets, sample letters and questionnaires. The brief chapter on selling techniques may be useful for the uninitiated in this field. Emphasis is on looking at your characteristics, personal skills and experiences, and the financial resources available to you. The worksheets at the end of each chapter are excellent for recording answers to the numerous questions that you will need to ask yourself and those around you. While the suggested reference sources may not be relevant to the Australian reader, there are equivalent Australian government departments to help with your research. *On Your Own* presents straightforward, practical advice for those who want to advance their career or leave the corporate life and start on their own.

Michael Taylor

Author	Carl D Peterson
Publisher	John Wiley & Sons
Distributor	Jacaranda Wiley
Phone	(02) 9805 1100
Price	$28.95
ISBN	0-471-14845-8
Rating	★★★★☆

Transitioning to Agility

We've all lived through a succession of management waves, and the next, according to author Alvin Gunneson, is the creation of the agile virtual enterprise. The objective of this book is to help you develop a "continuous transitioning system" (CTS) in order to move away from mass production to mass customisation. With the accelerating pace of technological advances, Gunneson warns that organisations must become agile to succeed. The content of this book is not revolutionary — much of the framework reflects Michael Hammer's competitive advantage and reengineering, Charles Handy's shamrock organisation and upside-down thinking, Peter Drucker's new business principles and John Kotter's business transformation frameworks. Indeed, Gunneson himself acknowledges that the agile enterprise is the synthesis of hundreds of ideas from the past decade about speed, continuous improvement, total quality management, re-sengineering and customer satisfaction.

As a founder of one of the longest-standing multinational quality and re-engineering consulting firms, Gunneson is able to include real-world examples to support and illustrate his advice. He offers a practical, holistic view of what is required in the transition process, warts and all. After laying the groundwork for essential conditions for agility empowerment, Gunneson presents a powerful self-diagnostic agility maturity grid to help you determine your organisation's readiness for agility. You are then able to assess where you are now and where you want to go. Gunneson spends considerable time addressing the various candidates for transitioning — the organisation itself, the leaders, the culture, the workforce and the processes. At the heart of agility, he writes, are teams, which will become increasingly important as organisations begin to move away from functional departments and towards self-managed teams.

Transitioning to Agility is a practical, well-written synthesis of techniques for creating a lean, agile organisation. A worthwhile buy for front-line practitioners.

Cathie Kennedy

Author	A Gunneson
Publisher	Addison-Wesley
Distributor	Addison Wesley Longman
Phone	(03) 9871 2400
Price	$32.95
ISBN	0-201-63496-1
Rating	★★★★

The Ultimate Multimedia Handbook

'Ultimate' is, of course, hyperbole, but this book does take an unusually broad view of multimedia, encompassing distance learning, imaging, artistic and literary works, conferencing and collaboration, voice recognition and response, VR, 3D graphics and electronic publishing. Unfortunately, it is an inadequate revision of the 1994 publication *The McGraw-Hill Multimedia Handbook*. It still quotes a 1993 article about the hardware needed (for example, a basic playback system is described as a 386 with 80M hard disk but without CD-ROM), and prices are way out of date (scanner prices start around $US1,200 to $US1,500). Other dated observations include "Gbyte hard drives are available" and "Most users of the Internet are accessing it using fairly slow 2,400bps modems . . ."

The *Handbook* is a substantial volume (the pages aren't numbered consecutively, but there are at least 1,000), though with 80-odd contributors, it reads like a collection of tutorials and conference papers rather than a unified work. There is tendency for similar material to be repeated, sometimes by a single author.

The more useful chapters describe the roles within a multimedia project team, how multimedia can be used to competitive advantage, and looking at the audience in order to design appropriate instructional materials. There is also some detailed information about digital audio and video, but the products and prices mentioned tend to be outdated.

Stephen Withers

Editor	Jessica Keyes
Publisher	McGraw-Hill
Distributor	Prentice Hall
Phone	(02) 9939 1333
Price	$125
ISBN	0-07-034530-9
Rating	★★

Tour the golf courses of Australia, take the bush-tucker trail, explore Farthing Wood, and visit the Ministry of Truth. **By Jeremy Torr**

Gone a-roving

The Bush Tucker Man

Hiya folks! Like my hat? Yes, it's Les Hiddins, the man with the gravel voice and 1,001 tricks up his khaki sleeve. Now the ABC has extended his tenure onto CD-ROM, and I must admit he makes the leap to the digital bush very well indeed. The first thing that strikes you about the CD-ROM is its quality. These are some of the nicest, sharpest images anywhere (after the benchmark Vietnam Experience, of course) and they have been put together in a well-structured CD that lets you wander walkabout-style, yet keeps your interest as sharp as a saltwater croc's teeth. The install is a bit intimidating, as a list of video cards that are forbidden territory scrolls ominously down the screen. I took a punt anyway and loaded and all went well, but there's no hint of this black list on the outside of the box.

The program lets you dig around in the back of Les's Landrover, looking at maps,

diaries, notebooks, binoculars and of course, the hat. All the integral actions are point-and-click simple, and the Hiddins 2000C laptop plays movies at the drop of a hat. In fact, the sheer volume of still images and (surprisingly good-quality) video is impressive. You can look for bush tucker by name, place or type, wander along some historical trails or Aboriginal ways, or go for a Tucker Tour. It's engaging stuff, and informative too. Hiddins confines his gourmet essays to north Queensland, but the hints and tips on bush survival are applicable almost anywhere — like what to use for bush clothes pegs, or how to make a tent from branches and banana leaves.

Although not quite such an easy viewing experience as the TV original, Bush Tucker Man houses a mine of fascinating food information in a simple and easy-to-navigate disc. Billy on, brew up and hats off to Les and the crew.

Distributor	Dataworks
Phone	(03) 9764 8344
Price	$49
Requires	486/100 or better, Windows, 16M RAM, 2x CD-ROM drive, 16-bit SVGA
Rating	★★★★

Chronicle of the 20th Century

Generally speaking, I admire Dorling Kindersley products immensely. They are immaculately crafted, superbly presented and always have impressive production quality and ease of use. This one is no different. It is different, however, in its approach.

Most titles such as The Way Things Work, The Human Body and so on are simple vehicles for information. This one raised my hackles rather with its US-based colonialistic approach to the events of the past 90 years or so. Apart from the blatant bias towards US events when cataloguing major world issues, the program is decidedly suspect in the way it portrays events. This could be very misleading to those genuinely searching for hard information — especially those outside the US. The actual information is presented in a very sanitised and black-and-white fashion, such as US troops being sent to Vietnam to quell the communist aggression, and China being allied to the Soviets during the Cold War. This kind of CNN 'all you need to know about the world in a TV screen' approach diminishes the veracity of the disc as a whole, which is a shame as lots of the information on it is useful and well referenced.

There is also, sadly, quite a lot of local US filler obviously designed to keep the user clear of too much harsh fact. Such as Charles van Doren admitting to cheating on a TV quiz show. This crops up as a major scandal which apparently equals the abdication of King Edward VIII in importance.

Navigation is easy, as usual. The interface can get a little confusing when jumping from news articles to news flashes to monthly chronologies, but there is a wealth of information there just itching to be looked at. Entries can be accessed by date, event, person or era, with special attention given to things like wars and personalities. There is also an engaging On This Day option, but despite the superb interface and solid information, I am still uneasy about the content.

Distributor	Roadshow Interactive
Phone	(02) 9552 8700
Price	$89.95
Requires	486/33 or better, Windows, 8M to 12M RAM, 2x CD-ROM drive, 16-bit SVGA
Rating:	★★

Fairways Downunder

A CD-ROM that lists virtually all the major golf courses in Australia and gives details of play at each one — some with pictures of the major holes and some with video footage from the air — is likely to sell well, given the right exposure. Fairways Downunder goes one better. It gives the details of the courses, but also allows the user to print out an individual scorecard for each course and hole, lists handy places to stay nearby and also lists

some courses in Asia you might be interested in for good measure.

The program offers a quick and easy way to select any of the more than 2,500 courses listed either from a map or by name. It offers basic course details on most entries, together with hole details and par lists. The keen golfer can dig out the course they want using a search facility, but this only works on a recognisable key entry. So, say you think the course sounds something like 'Fallowfields', it won't locate it without the exact name.

There are one or two rough edges around the images of the courses. The more remote or less important ones merely offer pictures of flags, people drinking in the nineteenth and so on. The more popular clubs have a selection of photos included, which dramatically increase in quality with a click of the zoom button. And the video footage of the Royal Melbourne, NSW, Tasmanian and Hope Island courses is very slick too. Variable zoom, speed and replay are all available, even though some of the original footage is a bit rough.

The program also offers details on equipment, although this is just a bit of interactive advertising, really. And to top it off there is a golfer's diary of events, plus a whole section devoted to famous golfers — including my hero, The Shark. A bargain for the deskbound golfer.

Distributor	Australian Windows Publishing
Phone	(02) 9890 9933
Price	$49.95
Requires	Pentium or better, Windows 95, 16M RAM, 4x CD-ROM drive, 16-bit SVGA
Rating	★★★★

The Animals of Farthing Wood

Not quite a game, not quite an educational program, not quite a politically correct statement — but very BBC. That's Animals of Farthing Wood. The game is aimed at seven to 11-year-olds who are familiar with badgers, moles and squirrels. Not quite your average Aussie bush inhabitants, but there you are — I said it wasn't an educational program.

The whole plot hinges around those nasty men with bulldozers and chainsaws who are chopping down the idyllic Farthing Wood to brew dioxin or something similar. They should, as all the animals agree, be stopped. On the way to avoiding the clearance and entering White Deer Park heaven, the player is required to check out some videos of squirrels eating nuts, rabbits having stones thrown at them, and you, the fox, munching small mammals of indeterminate species. That's what I meant by it not being quite politically correct.

As you wander about in the wood the program pops up handy video clips of animals doing things, allows you to check out how rainbows are formed, and offers a few distractions along the way in the form of wildlife video footage direct from the BBC vaults. I said it wasn't quite a game. The whole program is underpinned with some jolly twittering background muzak, and overlaid with a pompous-sounding old biddy who sounds like the nightmare schoolmistress from Devon — in fact, it is supposed to be the wise owl speaking. Overall a very mixed bag. But if you like Olde English myths such as coppices, spinneys and benign foxes with Cockney accents, get it. Otherwise, a bit of an iffy buy.

Publisher	BBC Multimedia
Distributor	Roadshow Interactive
Phone	(02) 9552 8700
Price	$59.95
Requires	486 or better, Windows, 8M RAM, 2x CD-ROM drive, 16-bit SVGA
Rating	★★☆

Interactive News

◉ The number of gadgets you can plug into your PC is increasing by the day. First we had the do-it-yourself speakerphone from Banksia in the form of the Wave SP, then the F1 steering wheel for would-be Damon Hills. Now we have the PC Golf interactive golf club. This dangerous-looking device plugs into the serial port of your PC -- or at least the sensor does. The wannabe Tiger Woods grasps a stunted club with a weighted head and built-in transponder which sends a signal to the PC to determine swing, direction, force, angle and everything but wind. The only thing you don't have is a ball to hit, but the PC screen pretends you do. The distributor claims it is the best thing around for improving your style on the green without employing a professional.

◉ Also on the interactive front, Microsoft is gearing up to hit the retailers with a new range of joysticks featuring dynamic feedback. These will enable the player to feel the thump of unfriendly fire, or even the resistance of a door when pushed open in some games. It is also working in-house on a new game based on the film A Bridge Too Far. Should be gripping. And to make the most of that joystick, look out for Flight Simulator 98, featuring helicopters and multi-plane action.

◉ Lastly, a curious by-product of last year's crash in the price of RAM chips has emerged from Japan. They're key-ring sized video games, many of which are quite sophisticated offerings such as Space Invaders and Tetris-lookalikes, and Pachinko-style gambling games. All have sound, controller pads and a high-resolution LCD display, but are packed into a key ring and selling for under $15. Isn't technology marvellous?

◉ The latest effort to get whole families onto the Net has come from OzEmail in the form of the Internet Family Pack. This offers four email addresses, a special family domain name and 20M of Web page space for $29.95. Access charges range from $1.50 per hour, so the deal could ensure that whole families now become Net addicted, not just the nerd factions.

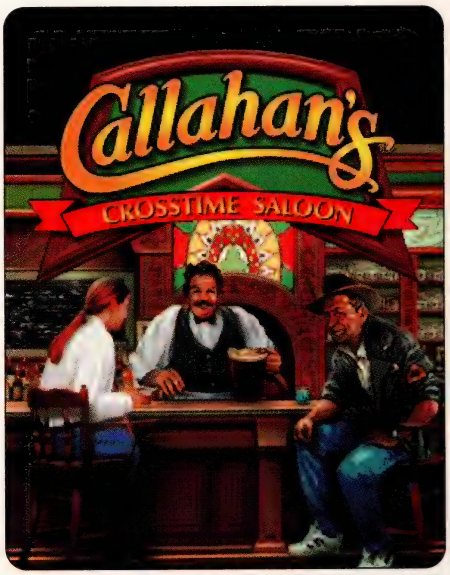
Jeremy Torr

Most of these games have interesting, creative plots with the odd exception.

Love an adventure

Callahan's Crosstime Saloon

One of the most original and engaging games to come along for quite some time. It's original for its concept and plot, and engaging because of the personality of the central character, Mike Callahan.



While he appears to be an ordinary Irish barman in a New York saloon — a setting complete with sawdust floor and sturdy timber furniture — Callahan is really a time traveller from the planet Harmony in the far distant future. Apparently the late 20th century will be a critical time in mankind's evolution, so the gods of Harmony have sent Mike and several companions to Earth to help achieve their utopian ideals.

This engrossing storyline by famed sci-fi author Spider Robinson was adapted by Josh Mandel (who did Freddy Pharkas and Space Quest VI), and between them they've made a great comedy adventure. The plot unfolds over six short adventure stories which take us from a Transylvanian castle to a Brazilian rainforest via Manhattan heading towards a really grand conclusion. Along the way there's whimsical humour and general hilarity in some general knowledge quizzes and bar games with the various saloon regulars taking part.

Each story starts with you interacting with one of the regulars. In one episode you'll meet Al Phee, an obnoxious travelling salesman. Dressed in a pyjama top, a propeller beanie, lederhosen and curly-toed shoes, he doesn't immediately inspire confidence, but he's a terrific wordsmith and great at the Saloon's 'Punday Nights'. He has some killer jokes. Another Saloon habitué is Pyotr, the well-mannered vampire who works daytimes in the blood bank. He's also the bar's designated driver and, while supposedly clean from his booze addiction, he maintains his personal blood-alcohol level by eliminating that of the saloon's patrons while he drives them home. And then there's Ralph von Wau Wau, a German Shepherd dog with human brain power and "exceptional conversational abilities". It's not clear whether he is — or indeed any of the others are — aliens, nor does it matter, as they all interact beautifully.

Add exceptional graphics and sound to the unique barroom mix of humans and aliens and you have a fun-filled, often thrilling but always interesting game. The useful instruction booklet has many tips and a useful walk-through if you get stuck.

Eric Holroyd

Distributor	Directsoft
Phone	(02) 9482 3455
Price	$79.95
Requires	486/66 or better, 8M RAM, 2x CD-ROM drive, VESA-compatible graphics or SVGA, Sound Blaster or compatible
Classified	M 15+
Rating	★★★★☆

Carmageddon

Copies of this game have sold like hotcakes in Britain and inspired considerable column centimetres in Australian papers. Queensland's Minister for Transport, Vaughan Johnson, has described it as "Anti-Christ, anti-family, anti-Queensland and anti-Australian", to the glee of its manufacturers.

In spite of all the hype, Carmageddon is not as graphically violent as, say, Rise of the Triad or Duke Nukem 3D, and the low resolution of the game saves us from too much explicit detail — unless you have a 3Dfx card.

Rather than explicit graphics, the cause of all the excitement is the malice involved: in order to complete the game you have to run down innocent people and animals in your car. For each person or animal you run down, you get credits, which can later be used to enhance your vehicle. Extra credits are awarded for splattering them artistically — landing on top of them from a jump or crushing them between a wall and your car. There is a special hotkey to instantly remove all the gore from the screen in case a kid (or other sensitive party) interrupts your game play.

In its defence, Carmageddon does not pretend to be a simulator. The viewpoint is more akin to Daytona than, say, Grand Prix II, and the game has almost a gothic-punk setting. The Office of Film and Literature Classification felt the game was acceptable for adult audiences, and has rated it MA 15+.

Fortunately, the game is about more than just killing pedestrians. Also on the agenda is completing the race (you have to drive through a number of checkpoints to complete the circuit) and destroying the other cars in the race by ramming them, driving them into barriers and whatever else you can come up with (this also earns you extra credits). Finishing a race will take you onto the next of a number of increasingly difficult tracks.

Some very clever physics are used in the game engine, and, although it operates only in low resolution, the gameplay is fast and the controls responsive. The sound effects are not too bad, either. One thing that was definitely on its side was the ability to do what you like. You can drive off the road, take side streets and go the wrong way. At one stage I found myself driving into the middle of a stadium in which a football game was under way.

All up, it's not really a bad car game, although it's a shame that it has to sell itself on its violence.

Nathan Taylor

Games News

- At the recent Electronic Entertainment Expo (E3) in Atlanta, Microprose showed off its new MechWarrior version. With more of everything, plus a paint program for customising Mechs, it's different from Activision's MechWarrior and is more like Heavy Gear.
- An E3 standout was Sega's Jurassic Park: Lost World, which grabbed even hardened industry pros with its ultrarealistic dinosaurs and knockout SFX. Its Tomb Raider 2 gives Lara great new moves and weapons and fantastic environments.
- Activision and id Software have joined forces to distribute Quake II worldwide. Activision also has sequel rights to the acclaimed Little Big Adventure.
- Virgin's nine new E3 games included Sabre Ace: Conflict Over Korea; NHL Powerplay 98, a sports fan must; and the cerebral The Smoking Mirror.
- And on the home scene, Ubisoft's neat new car racer, F1 Racing Sim, is a Formula One job with all 16 1996 Championship circuits and real-life F1 drivers.
- This month brings Microsoft releases like Close Combat 2; the Indy racer CART; MS Golf Version 4.0; and Flight Sim 98, complete with helicopter and multiplay.
- Disney Interactive's Magic Artist lets kids create Disney artwork using realistic computer art tools like smeary paint, waxy crayon, pencils and chalk.
- Interplay's Atomic Bomberman is a really cool and super-addictive Windows 95 game where up to 10 players walk around a maze trying to blow each other up while using wacky power-ups and comical taunts.
- Brokensword for Mac is out from Sega, whose new PC titles include Virtual Karts Powerplus, Star Trek: Generations, and Star Trek: Final Unity Powerplus. It also has a $29.95 hint book to help with Ecstatica II.
- Warlords III, jointly produced by Brøderbund and Australia's Strategic Studies Group, is due soon.
- Lords of the Realm II Siege Pack; Civil War Generals II, Lords of Magic, and Captives are new Impressions strategy titles added to Metro's impressive Sierra On-Line catalog.
- Try these cheats for LucasArts' Outlaws: OLIMYELLA — toggle full invincibility; OLPOSTAL — get all weapons; OLBOUNCE — toggle super jump; OLASH — unlimited ammo; OLGUSHER — unlimited oil.

Eric Holroyd

Distributor	Hilad Corporation
Phone	(02) 9700 9377
Price	$89.95
Requires	Pentium 75 or better, Windows 95 or MS DOS 6.2, 16M RAM, 4x CD-ROM drive
Classified	MA 15+
Rating	★★★

Dungeon Keeper

Ever since the first RPG, the dungeon keepers have been the victims. All their hard work gets put to the torch every time the next lot of heroes comes along to end their existence. Now it's time to strike back.

It's your turn to be the dungeon keeper, with the task of building a dungeon, populating it with monsters and repelling heroes and other would-be dungeon masters. Despite the turning of the tables, Dungeon Keeper is very much of the Command & Conquer/Warcraft genre, with a few added complications thrown in.

Using imps as your basic dogsbodies, you need to tunnel through the rock to create rooms and passages in each scenario. You also need them to mine gold and gems so that you can build special rooms: monster lairs, hatcheries, training rooms (which are used to increase the level of your monsters), torture chambers, graveyards and so on. Building a library will also allow you to research spells, which you can use directly on your minions and enemies. Build a workshop and your trolls can build traps and devices to be placed at various points around your lair.

You also need to capture a portal so that the nasties who are to be your minions can enter your domain. These come randomly, although the way you design your lair can affect which sorts of creatures you attract most: build a large library, for instance, and you will get a lot of sorcerers appearing at your doorstep.

Like all great games, Dungeon Keeper has plenty of attitude. To start with, you're not a very nice guy. You torture and imprison your creatures and enemies with equanimity. An imp is digging too slowly? Give him a backhander and he'll speed up. Sorcerers slacking off? Torture one of them — the rest will get the message.

Managing your troops is a major part of the game: if you don't keep them happy, then they'll either start deserting or taking out their frustration on their fellow troops. Each type of creature has its own likes and dislikes, and some creatures just don't get along (flies and spiders try to kill each other at every opportunity). The number of factors affecting monster behaviour is huge, and all these have to be taken into account if you want to conquer the game.

Controlling the game with the mouse is not difficult, although true masters will learn the keyboard shortcuts if they wish to conquer their friends in multiplayer mode. Up to four players can challenge each other at one time.

One outstanding feature is the ability to enter and control your own beasts. Using the correct spell, you can turn Dungeon Keeper into a 3D adventure. The abilities and attacks of each monster you enter depend on the monster and its level. Enter a fly, and your vision will be blurred by hexagonal images. And the graphics in 'monster' mode are as good as any 3D shooter out there.

The graphics in 'normal' mode are not to be sniffed at, either. You are given the freedom to pan, zoom and swivel the isometric view at will, allowing complete freedom of movement. The sound effects are excellent, from the moans of prisoners and torture victims to the screams of battle. If you're a strategy fan, get it.

Nathan Taylor

Distributor	Electronic Arts
Phone	1902 261 600
Price	$89.95
Requires	Pentium or better, 16M RAM, 4x CD-ROM drive, VESA-compatible graphics or SVGA
Classified	MA 15+
Rating	★★★★☆

Fallen Haven

This isn't just your average cerebral strategy game, but a nice mix of tactical planning and battle action. It's a bit like a very complex chess game where the pieces actually fight it out when you've made your move. However, it's not restricted to anything like a chessboard. It's set in a vast galaxy of colonised worlds ruled by the Matsusony-Laanson Corporation, which has its headquarters on the planet Capital World.

Most distant of the colony worlds is New Haven, home to 15 separate, heavily-armed provincial governments. The oldest established province is Haven, and its leaders, disgusted with its manipulation and greedy profiteering, have decided to break the Corporation's hold over the colonies. To do that they've built their own arms factories, so they have weapons not available in the other colonies. Good thing too, because they're now at war with the other 14 governments and the corporation might just call in armies from other planets, too.

The clean, crisp graphics are in that 45-degree perspective so beloved of action-game programmers, accompanied by appropriate battle sound effects. Toggling between action and menu screens is simple, but a great deal of thought required before sending troops into battle.

Armies gain valuable battle experience that shows up here in the form of 'pips', along with the selected unit's name and status information. Multiple pips indicate the highly desirable 'veteran' status with its improved firing accuracy.

Don't think that sheer might will triumph. The energy efficiency and resistance of your structures, the speed and rate of fire you set for your weapons, and your nuclear rocketry are all important. Think carefully about the technology you use and you're more likely to win out in the end.

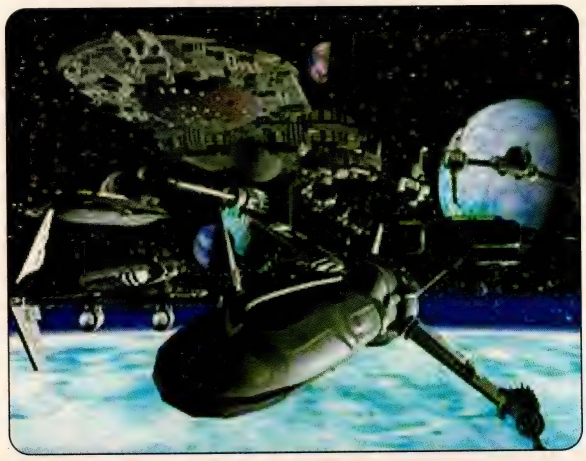
Eric Holroyd

Distributor	Sega OziSoft
Phone	(02) 9317 0000
Price	$79.96
Requires	486DX2/66 or faster (Pentium recommended), 8M RAM, 2x CD-ROM drive, SVGA video card, Sound Blaster or compatible
Classified	G
Rating	★★★★

Imperium Galactica

Now here's a game for strategy fanatics — impressive graphics, smooth gameplay and, best of all, a unique perspective on the popular genre. Imperium Galactica doesn't see you as some omnipotent being controlling vast forces and resources, but as an aspiring starship captain, piloting the vacuum of space, keeping order and protecting humankind from all things nasty.

More than this, Imperium Galactica has a story. A plot in a *strategy* game? Yes indeed. It's effectively a strategic adventure. This gives greater meaning to your military conquest, but also greatly reduces the replayability of the game.



And the deal? Where does galactic expansion, iron-fisted ruling and vast fleets at war come into it? Not for a while, actually. Only those responsible enough to handle such power are given it. As the central character you start at the bottom and must work your way to the top by performing a variety of missions, such as destroying pirates, stamping out planetary plagues, and making sure the small number of planets under your command actually survive the conditions of their environments.

As you go up in rank you gain access to bigger ships, bigger guns and more of that empty, cold vacuum to patrol. Eventually you'll make it to Admiral and this is when the fun really starts, for then the whole of known space is available to you, complete with its hostile alien inhabitants. You can research new toys, manage newly colonised and captured planets, and slowly build up a vast armada with which to welcome your neighbours.

Great care has been taken to ensure an enveloping playing environment. All ships, equipment and research topics appear in rotating, rendered sci-fi glory, along with wire-frame models and appropriate statistics lists. Starmaps can be zoomed in on, ship combat can be watched in real time and planetary systems are managed in a similar way to SimCity. The atmosphere of starship command has been captured well, and you even have a family. At odd intervals you'll receive messages on your slide-in message pad. Some messages deal with boring planetary issues and silly panic messages from the Earth government, but some are also video-mails from your wife telling you how Junior is doing. It's a nice touch, adding extra depth. It makes it a bit of a stretch for most female players, however. Is this the makers' vision of the future?

A real-time playing environment, fancy graphics, planetary and space conquest, and subplots of subterfuge and intrigue will keep you entertained for quite a while.

Ashton Mills

Distributor	Roadshow
Phone	(02) 9552 8600
Price	$89.95
Requires	Pentium 60, DOS, 8M RAM, 4X CD-ROM drive
Classified	G
Rating	★★★☆

Amid a sea of fan euphoria, 'official' Web sites for TV shows, movies and musicians are now proliferating — but are they any good?

That's entertainment?

Men in Black

It's an accepted part of a marketing strategy for Hollywood to push a Web address in the pre-publicity for its films. Men in Black (MiB), a comedy about a top-secret US government organisation charged with defending the planet from aliens, is no different.

Remember when 'Star Wars' came out, and there was endless speculation about the technology, alien species, Skywalker family genealogy and so on? Back then, there was no way to find out except by waiting for Lucas to make up the supplementary stories and release them.

The Web neatly solves this problem, as the MiB site demonstrates, by providing weapons profiles, MiB history, alien backgrounders, a making-of-the-movie section and an MiB magazine area containing what I suspect are tongue-in-cheek conspiracy articles.

Scarily, there seem to be plenty of people out there who take aliens and conspiracies super-seriously — seriously enough to post extended rants on the chat boards tied to the MiB magazine. These make interesting reading, assuming you're not paranoid enough to take them at face value. Do it at about 4am, not so you can scare the willies out of yourself, but so you have a reasonable shot at downloading the graphics-heavy content sometime between now and the next millennium.

You'll also need to get Shockwave for two reasons: the site is pretty boring without it, and your ISP will love all the extra time you spend online waiting for the weapons animations. QuickTime VR is also required for a small part of the site, too.

As your grandmother probably puts it, the proof is in the pudding. My grandmother used to put five-cent pieces in the pudding, and I've never figured out what that meant, but as a site, MiB does almost make me want to see the film. It has humour, a quality lacking in many sites (and films). It's also had a lot of work put into it, which is sort of sad, considering that it won't be there in eight months' time. It's a must for lovers of science fiction, and worth a look for everyone else.

Josh Gliddon

■ ONLINE http://www.meninblack.com/
■ RATING ★★★★

Savage Garden

In January this year, when Brisbane pop duo Savage Garden's second single 'To The Moon And Back' was soaring its way to number one, the band's Web presence was fairly minimal. When I carried out a search at the time, I located just two pages referring to them.

Nine months later, not only are there more than 30 fan sites out there, but Savage Garden also enjoys the relatively unusual distinction of having two *official* sites. The first is run locally by the band's Australian record company, Village Roadshow, while http://www.savagegarden.com is controlled by the band's American label, Columbia.

Despite this global split (which is also reflected in the fan mail posted to the bulletin boards at each location), the two offerings have many features in common. Both include the standard commercial music-site accoutrements: a hagiography, a news section (well maintained in each instance) and basic release details for albums and singles. Each also offers a selection of audio and video downloads. The Australian site has a more comprehensive set of videos (in MOV format), while its American sibling has a full range of RealAudio samples.

The spartan design ethic of Savage Garden's releases is well-reflected in the sparse but considered look of each site. Interactivity is essentially limited to the aforementioned bulletin boards, but these were well populated when *APC* visited, and they avoid the bandwidth-hogging antics of self-indulgent plug-in frenzies.

Both sites serve the basic purpose the record companies doubtless intended them for: maintaining fan interest in the band, and providing some teaser material for people with a passing interest in the work. Neither is likely to convert you to the Savage Garden cause if your tastes run to industrial rock or politically-charged folk, but that's unlikely in any case. What is really interesting about Savage Garden is the way fan sites have sprung up in a complementary role to the two professional offerings. Conventional wisdom on Web entertainment sites holds that while the commercial sites will be able to offer video and audio goodies without violating copyright, they rarely attain anything like a sensible level of detail.

In this case, though, a very high percentage of everything most people would want to know is available from one of the two official sites, leaving the fan sites filled with treasure for the truly dedicated. Whether this will still hold true a year from now is an interesting question, but for now the two models — commercial and community — are happily coexisting.

Angus Kidman

■ ONLINE http://www.village.com.au /savage/
■ RATING ★★★

Guide to ratings

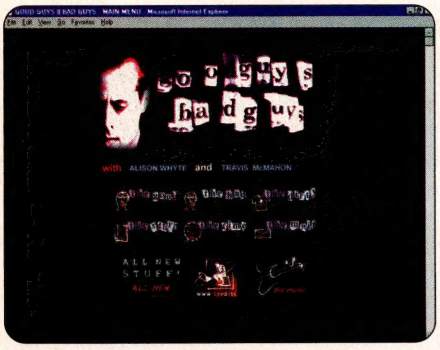
★	In-fan-tile
★★	For fan-atics only
★★★	Fans the flames
★★★★	*Così Fan Tutte*
★★★★★	Fan-tastic!

Good Guys Bad Guys

Years ago, if you were a fan of a TV show, you bought the annual. Among the badly-drawn, badly-plotted cartoons of the A-Team or Skippy, profiles of the characters and related facts appeared in a bid to give them more depth than television allowed. It is quite possible that official television Web sites are the annuals of the 1990s, lacking only the crappy illustrations on cheap paper. The Good Guys Bad Guys site is a prime example.

The 'Good' section of the site contains profiles of the show's three main characters, and photos and links to their favourite Web sites. Blurring the distinction between reality and fiction, fictional characters recommend real sites, such as Triple J. Since our hero Elvis Maginnis is a man about town (this attested to by a long list of ex-girlfriends), one of his favourite sites is a florist.

The site is quite good at maintaining the illusion that the characters are real. You have to scroll through reams of information and pictures on each character to



find profiles of the actors, such as resident spunk Marcus Graham and Frontline's Alison Whyte.

'The Bad' profiles the villains on the show (surprise!), listing them all in episode order. One of the strangest sections is 'The Dirty' which details the dirtiest character from each episode, and also discusses the stains encountered in each episode. In episode 13 Maginnis ends up with a chocolate stain on his shirt, and hence the tip for that week is how to remove such a stain.

The all-important episode guide can be found in 'The Show' section. After all, even diehard fans need to be sure that they've taped/watched every episode.

'The Time' lets you know what time Good Guys Bad Guys is on, as well as offering a heap of links to Web sites on the theme of time.

One thing that the site has over annuals, apart from better pictures, is interactivity. 'The Mail' is your chance is to send any of the characters a message. You can also read what others have posted, although having your message posted on the page is optional, so if you don't want anyone to know that you sent Maginnis an email that says 'I reckon you're a spunk', you're safe.

This site is worth a look if you're a fan of the show, as it does achieve a little more than merely listing screening times. I kind of miss the cheesy cartoons, just the same.

Kerrie Murphy

■ ONLINE http://www.goodguysbadguys.com.au

■ RATING ★★★

Surfbaud: Smooching in cyberspace

Why is it that kisses on television appear so easy — glamorous even? The kissing couple always look as though they're having the most wonderfully romantic time. In the land of TV tongies there are no awkward bumps of teeth or noses, no pauses or gasps for air — and the guy never gets lipstick smudges all over his mouth. Maybe Dooley Wilson didn't get it right in Casablanca when he sang 'a kiss is just a kiss'. After all, there are kisses and there are *kisses*. You can become an expert at http://www.flirts.com/kissing .html, where you can learn how to smooch with style. Firstly, kiss as though you have all the time in the world. Then finish gracefully — end with a soft parting rather than a wetly dismissive smack. Finally, every now and then you can reclaim the magic by pretending it's the first time you've ever kissed this person.

If you've yet to venture forth with your pioneering peck, don't be scared. Few events are ever as memorable as your first kiss, so either go with the flow or do a bit of old-fashioned research at First Kiss (http://www.one-and-only.com /kiss .htm) where you can read the heartwarming, silly or downright sordid tales of other people's first times. How to Kiss (http://www .columbia.edu/cu/healthwise/0903.html) is a more mature look at what to do once you get to first base, and is aimed at 'oldies' (17 and above) who have never been kissed. But keep one thing in mind: if you are ever unsure of whether or not to kiss a good-looking guy or gal, always give them the benefit of the doubt.

For some people, kissing pets is the cause of a more serious ailment then anxiety. Several deaths have been reported from getting a little too close to canine or feline friends (it must be true if it's on the Internet). According to Pets and Parasites (http://www.hsu.com/pets.html). The worms and germs living on the bods of your best canine and feline friend can prove fatal, so keep your pucker planted on lips of the human kind.

The genteel art of kissing a lady's hand has slowly died out but Ioseph Of Locksley's Guide to Hand-Kissing (http://www.primenet.com/~ioseph/handkiss.htm) aims to resurrect this gallant action. I'm all for it, as long as guys obey the number one rule — dry lips, thank you very much. Of course, the rock group KISS (http://www.kissasylum.com) could never be described as genteel. Gene played the monster of KISS and would also have been a monster kisser, having had his tongue surgically altered so it could hang out of his mouth another two inches.

From deep within the 'only in America' file comes a contraption guaranteed to draw mesmerising kisses from your pucker-impaired partners. Basically, you pass an electric current through your lips. Sounds kind of shocking to me. If you can't be there to plant a big fat juicy kiss on your loved one's lips then show them how much you care by sending them a virtual kiss (http://www.thekiss.com/ekiss/ and http://www.sendakiss.com.au/). Both sites get around any awkwardness a newbie kisser might feel (like actually having to kiss someone) '90s style, with pictures and sound . . . how romantic. Less dreamy are the real-world pitfalls of kissing anyone wearing braces. Kissable Kovers (http://www.masel.com/kissable/kissable.htm) are nifty pieces of plastic that slip over those silver railroad tracks to ensure a snag-free snog.

If after all this you still can't get a guernsey, your last resort is the Virtual Kissing Booth (http://www.whitehawk .com/vkb/). Don't worry, you're not alone, this site is visited by thousands of other lonely lips. By emailing in a picture of your face (or whatever else you might have) you can volunteer to be smooched by visitors.

Samantha Amjadali

Before you pucker up to your 'puter, email me at samantha@bigpond.com with your sites or suggestions for Surfbaud.

I saw the best minds of my generation destroyed by madness, starving hysterical naked. Odds on, they worked in the IT industry. Or they read Chip Chat.

Chip Chat

Giveth and taketh

Qantas recently upgraded its Web site, adding online access to frequent flyer data for members and putting up flight schedule details (which is a pretty obvious thing for an airline to do, if you think about it). However, it seems that the Flying Kangaroo mob aren't entirely convinced of the virtues of this newfangled technology stuff.

The airline has also been running a series of advertisements headed 'The original World Wide Web', which reads in part: "These days, it's very trendy to talk about global villages, internet, world wide webs and cyber-anything. Frankly, we don't see what all the fuss is about. After all, we've been connecting people around the globe since Bill was a mere glint in the eye of Gates Snr." After a tedious listing of places Qantas flies to, the add concludes: "So, where would you like to go today?" Given all that Microsniping, we were quite surprised to discover that the site does actually work in Internet Explorer.

Alston fired up

An intrepid Chip Chat mole reports that Senator Richard Alston, the politician we'd have to dislike even more if Amanda Vanstone wasn't around, recently proclaimed to one of the few remaining ABC radio reporters that the Internet had only been around for two or three years. We can't believe that Senator Alston would make such a stupid mistake on the ABC, given that he could act like an idiot on any number of commercial stations and nobody would give a rodent's posterior.

Harassment plus

The ongoing feud between Novell and a cluster of its former clustering staff has turned even uglier. In the most recent round, former chief scientist Jeff Merkey (who has since left to form a new company, Timpanogas) filed a sexual harassment complaint against Novell senior vice president Denice Gibson. *Infoworld Electric* reported that Merkey's complaint alleged that Gibson "rubbed her breasts against me, touched me in the groin area, and attempted to solicit me to sleep with her". Who said nothing ever happened in Utah?

The TARDIS factor

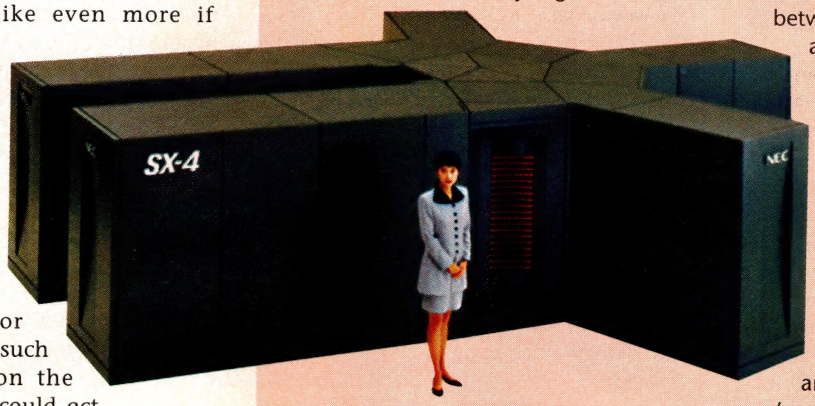
Our thanks to an alert reader who called our attention to a recent advertisement for a computer support position which demanded, among other things, a minimum of two to three years' experience with Windows 95. Given that Windows 95 hadn't even passed its second birthday when the ad was placed, this seems like a rather excessive demand. Come to think of it, if the ad had instead sought exposure to Windows 95 via the Microsoft hype machine, then it probably could have requested an entire decade.

Fast facts

A cursory search by AltaVista reveals that there are at least 24 sites which feature the words 'Bill Gates' and 'gerbil', while no sites feature a conjunction of the phrases 'Marc Andreessen' and 'truncheon'. No, we don't know what it means either.■

Contest: We like 'em big

NEC Australia got a teensy bit excited recently when it managed to sell one of its SX-4 supercomputers to the Bureau of Meteorology and the CSIRO. While NEC claims to have a 10% market share for supercomputers, this is the first NEC system to be sold in Australia, which tends to suggest that we are not actually talking about a very large market.



Moving along at a trifling 104 billion calculations per second, the SX-4 might seem to be one of the few machines in the world actually capable of running Office 97. However, it is apparently destined for more mundane tasks, such as predicting whether or not it will rain tomorrow.

While not wishing in any way to disparage the work of the CSIRO or the Bureau (both fine organisations), we can't help thinking that there could be more exciting things to do with that amount of processing power. We could construct a virtual model that would predict exactly when Tori Spelling's chest will collapse. We could calculate the average difference between predicted shipment date and actual shipment date for every software package ever released. We could do an in-depth study of the aerodynamics of Ray Martin's hair.

As ever, though, we trust that our readership will be able to come up with far more creative suggestions, and we are willing to offer a small prize to budding research projects. The reader who submits the most amusing suggestion will win a year's subscription to *APC*. Enter on our Web site at http://apcmag .com, send email to researchthis@acp.com.au, or write to Research This!, *APC*, PO Box 37, Sydney NSW 1028. Entries close September 30, 1997; the winner's name will be published on our Web site. For full terms and conditions, see page 237.

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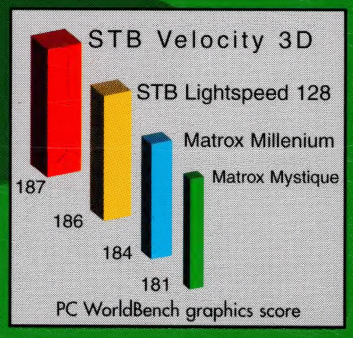

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